

# **AIRFIX** magazine

NOVEMBER, 1967

**FOR PLASTIC MODELLERS**

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**IN  
THIS  
ISSUE**

- \* Camouflage schemes for RAF fighters
- \* Conversions with the Airfix 'Daring'

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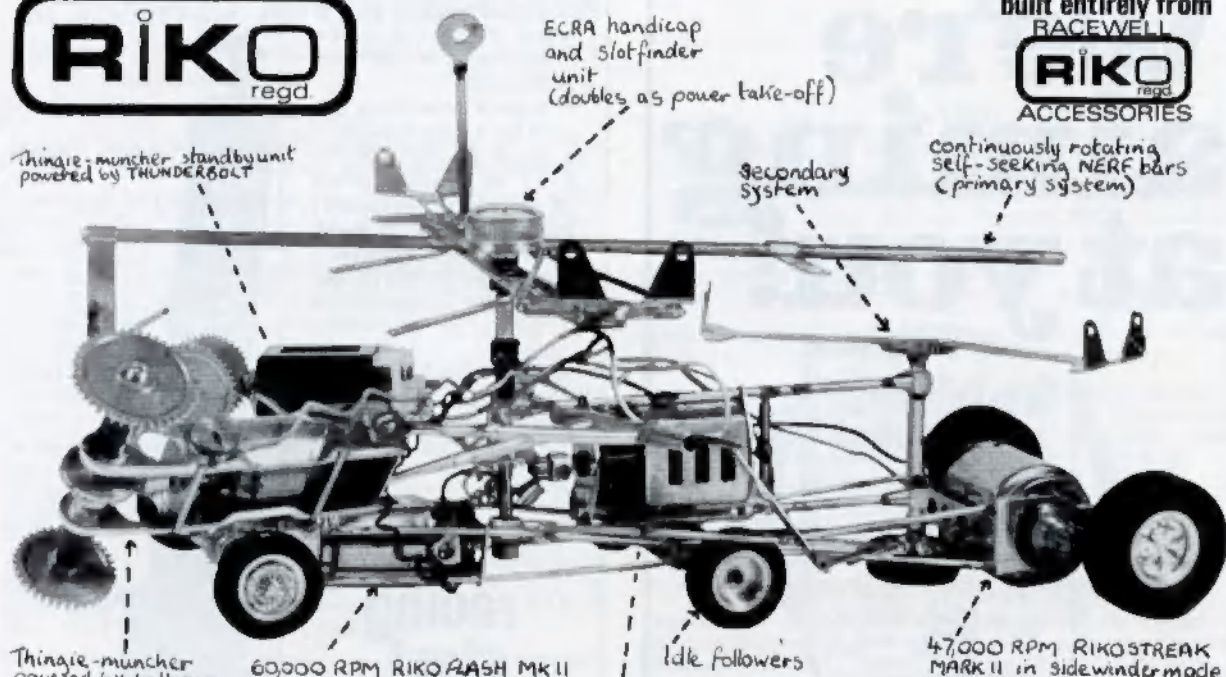
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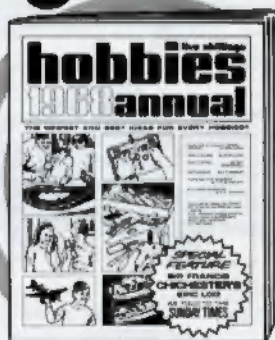
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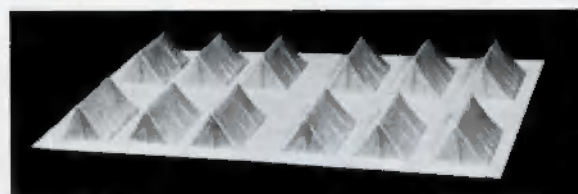
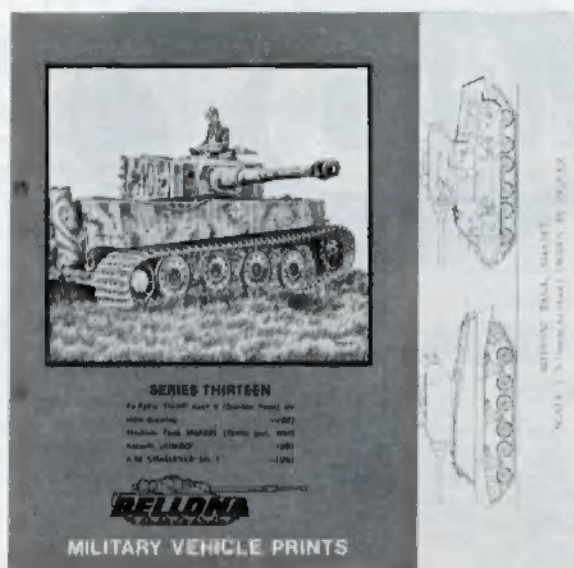
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AIRFIX magazine



# AIRFIX

## FOR PLASTIC MODELLERS

Volume 9, Number 3

### magazine

November, 1967

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#### COVER PICTURE

Superb atmosphere shot of a 175 Sqn Typhoon 1B in the Summer of 1943 reveals much useful detail for modellers, not least the bomb trolley and the dispersal bay. More notes appear on page 105 this month. Modellers wishing to convert the Airfix Typhoon to a 1B will find useful drawings and details in our January, 1961, issue.

(Imperial War Museum)

AIRFIX magazine is published for the proprietors, Airfix Products Ltd, by Knightsbridge Publications (1962) Ltd, on the fourth Friday of each month. Annual subscription rate 30s (USA \$5.50). Second Class postage paid at New York Post Office, NY.

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NEXT PUBLICATION DATE: November 24, 1967

November, 1967

#### EDITORIAL OFFICES AND ADVERTISEMENT DEPARTMENT

3-4 St Andrew's Hill, London, EC4  
Telephone: LUDgate Circus 8842

#### CIRCULATION DEPARTMENT

Surridge Dawson & Co. (Productions) Ltd  
Publishing Dept, 26 Aberdour Street, London, SE1  
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Above: The SM79 Sparviero. Right: The Mig 21c, both in 1:72 scale.

# NEWS FROM AIRFIX

The world's greatest value in construction kits

- SM79 Sparviero bomber
- Mig 21c fighter
- 'Free Enterprise II' ferry ship
- Porsche Carrera 6 in kit form

**M**AINSTAY of second world war Italian bomber squadrons and perhaps the best land-based torpedo bomber of the war, the Savoia-Marchetti SM79 Sparviero ('Hawk') Mk II is the subject of a big new 1:72 scale model construction kit.

Over 100 moulded polystyrene parts are employed to build the 11½ inch wingspan Airfix model. All detail of the original Sparviero has been captured in faithful miniature—right down to a tiny separate wind-powered dynamo and two 3-inch-long torpedos. All three propellers as well as the wheels are rotatable, and ailerons, elevators, and rudders are hinged.

The Savoia-Marchetti SM79 Mk II kit is complete with full assembly instructions and includes painting directions and a set of full colour marking transfers. Price is 7s.

**W**ITH the introduction of Russia's most up-to-date lightweight fighter, the Mig 21c, (Nato code name: 'Fishbed-C') as a new 1:72 scale model construction kit, Airfix for the first time provide the modeller with a choice between three different finishes.

One of the world's most widely used frontline fighters, the Mig 21c is in service with no less than 17 air forces including those of the Soviet Bloc, the Middle East, Cuba, India and China. Although intended mainly for local defence in clear weather, it has proved to have performance almost

equal to the most sophisticated western fighters while only costing probably a quarter as much as the US Phantom II.

The 40 parts in this kit provide for the construction of a most realistic nine-inch model of the Mig 21c. Authentic colour transfers allow a choice between Russian, Finnish and Czech versions. Full building instructions and painting directions are provided in this kit, which is priced at 3s 6d.



**T**HE car and passenger ferry *Free Enterprise II*—one of the world's newest and most advanced—is the subject of the latest Airfix 1:600 scale ship construction kit.

Operated by Townsend Car Ferries, whose green and white vessels are a familiar sight to thousands of motorists and their families, *Free Enterprise II* carries 1,000 passengers and 205 cars between Dover and Calais or Zeebrugge.

The 354 foot long, 4,122-ton ship, was built in Holland in 1965 at a cost of £1,800,000. Her 20 knot top speed is provided by twin 4,000 hp main propulsion engines.

Nearly 80 accurately moulded polystyrene parts in the Airfix kit build into an intricate seven-inch model of *Free Enterprise II*. Full instructions for assembly and painting and a set of transfers are included in the kit, which costs 3s 6d.

**F**IRST of a new range of sports/racing cars to join the Airfix 1:32 scale construction kit line-up is the German Porsche Carrera 6, a static version of the model which has already been released in motorised form in the Airfix and Airfix/MRRC racing series, as described in News from Airfix in the last two issues.

Full instructions are included in the kit which is priced at 2s 3d.

**Below:** The Porsche Carrera 6, now released in 1:32 scale kit form. **Bottom:** Townsend's *Free Enterprise II* in 1:600 scale.







Resplendent in its new Polyurethane camouflage finish—detailed on page 89—one of the new Lockheed C-130K Hercules flies in to RAF Lyneham. Note the 'ROYAL AIR FORCE AIR SUPPORT COMMAND' legend on the fuselage.

**T**HE newest aircraft to enter RAF Air Support Command squadrons is the Lockheed C-130K Hercules, an aircraft of considerable versatility, which will add a great deal to the facilities available to the air mobility of this country's ground forces. The first squadron to be re-equipped with Hercules is No 36 which has just completed the acceptance of all nine aircraft making up the squadron's complement at RAF Lyneham.

There are 66 Hercules on order for the RAF, and four squadrons of Air Support Command in the UK and one in the Far East will have them. They will be replacing the aged Hastings and Beverley aircraft formerly the mainstay of tactical transport in 38 Group. Lyneham will become the main base for the Hercules although the Britannias and Comet 4s at present resident will continue to operate until the long range transport base at Brize Norton is complete.

No 24 Squadron will be the next to have Hercules. They are due to start replacing their Hastings before the end of the year and will also work from Lyneham. Colerne, previously the main Hastings base in the UK will become the centre for maintenance and servicing Hercules squadrons at home and in the Far East. No 48 Squadron, the first unit in the Far East to have Hercules, took delivery of the first aircraft during October.

The other two squadrons destined to exchange Beverleys for Hercules are No 47, at present at Abingdon, and No 30, formerly a Middle East Command Beverley squadron which will form at RAF Fairford, Glos, next year. In 1970 these two squadrons will join Nos 36 and 24 at Lyneham.

The first Hercules to arrive in this country arrived last December and to date 32 have been delivered at a rate of about one a week. The aircraft are ferried to Marshalls of

Cambridge from the manufacturers at Marietta, Georgia, by RAF crews, 26 of whom underwent training in the United States before the formation of No 242 Operational Conversion Unit at RAF Thorney Island. Marshalls apply the camouflage and complete the fitting of the various items of British equipment in the aircraft. All 66 Hercules are due for delivery and will be in service by next summer.

When I visited RAF Lyneham last month to see the new squadron I was shown a few of the many jobs of which this aircraft is capable. Much of the equipment and certain parts of the actual construction of the C-130K has been completed in Britain presumably to standardise the aircraft for the RAF and at the same time save dollars. The roller conveyor system, for example, is one of the items supplied direct from home industry and I saw many different varieties of load being prepared for supply dropping. Troop carrying and paratrooping will also feature and, if required, the

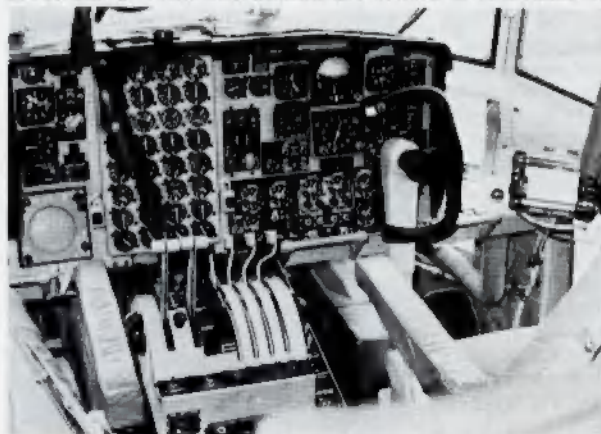


Hercules can quickly be adapted for an aeromedical role. There are seats for 92 troops and in the aeromedical role 74 stretchers can be accommodated. In airborne assault operations 62 paratroops can be dispatched in two simultaneous sticks through the rear fuselage doors or alternatively 40 paratroops can jump from the rear loading ramp.

This ramp lowers to about three feet from the ground and is just about in line with the normal truck floor. The roller conveyor system which can be connected to a similar installation on a lorry is used to quickly pass difficult loads from one to the other and at the same time be used to dispatch heavy equipment by parachute simply by giving the whole assembly attached to the rollers a good hefty push! The load is attached to a pallet and this in turn to a supply drop parachute.

I was very impressed by the size of the Hercules cargo hold. This measures 41 ft long, 10 ft wide and 9 ft high. During the day I flew in the aircraft and although very noisy compared to a lot of other aircraft I know, it gave ample room for almost all conceivable loads from two Scout helicopters to 16 one-ton containers. Sitting near the rear loading doors on take-off I found the 'plumbing' made very peculiar noises but presumed that this was to do with the hydraulic systems of the undercarriage. Inside the fuselage with the doors closed one had a distinct feeling of being in a ship rather than an aircraft. Lagged pipelines were everywhere, coupled with an amazing variety of wiring. Most of the internal surfaces were padded to lower the noise level in flight and I also noticed that all the required assembly sections for any of its several roles were part of the normal equipment and stowed under seats or neatly

*Continued on next page*



The impressively equipped Hercules flight deck—pilot's eye view of the control and instrument panel.



## In the Air—continued

hitched to wall brackets. Gone are the days, I was told by one aircrew member, of dashing across the airfield with the bits and pieces to turn the aircraft from a passenger-carrying to an all-freight configuration.

Impressive too was the flight deck. The Hercules carries two pilots, a navigator and engineer in the front and an air quartermaster to look after the loading and dropping of supplies, both human and otherwise, at the back. 'It's absolute luxury,' I was told, and looking around one could see the reason for this statement. There is ample room for both pilots to get in and out of their seats, the engineer sits right behind them operating an instrument panel in the cabin roof and the navigator has his desk on the right. Behind the crew positions there are two bunks and the galley, incorporated in the entrance to the flight deck. Although the latter is small, it has provision for frozen meals which can be quickly heated whilst on the route.

Remembering several long flights in Beverleys, I could see what this crew meant by the word luxury! Hercules aircraft will be used for regular freight services to the Far East, reaching Singapore in 27 hours' flying time. The long range of the Hercules will enable these flights to be completed in three stages: UK—Bahrain—Gan—Singapore. During training a No 36 Squadron crew did a 3,000 mile trip to Toronto in Canada against head winds in 12 hours' flying time. The return trip was made in 8½ hours.

During my visit to Lyneham I was told that the introduction of the Hercules will notably accelerate the dispatch of airborne troops. A typical brigade group parachute drop of about 1,000 men with their vehicles and equipment by a mixed Hercules and Argosy force will be completed in five minutes less time than required when Hastings and Beverleys were used. The number of aircraft to mount such an operation will also be reduced as 15 Hercules will replace 14 Hastings and six Beverleys.

Although the Hercules is smaller in its main dimensions than the Beverley, two things stand out from a comparison of performance figures. It is substantially faster (345 mph cruising speed against 180 mph), heavier, and more powerful. The normal maximum operating weight of 155,000 lb (135,000 lb in the Beverley) can be increased to 175,000 lb—more than 78 tons—for emergency use. In addition the Hercules has a fuselage mounted gas turbine compressor for engine starting when external ground power supplies are



The Hercules greatly increases the RAF's tactical lift capacity for military equipment; here a Saladin armoured car backs up the stern ramp into the cargo hold.



Top: Sombre black undersides of the Hercules is to reduce reflection in searchlight beams when the aircraft is operating at low altitudes. Above: Fine view of the camouflage pattern—compare with drawings opposite.

not available. The aircraft is fully pressurised and can operate at heights above 30,000 ft. Last June a team of RAF parachute instructors of the Airborne Forces section at the Aeroplane and Armament Experimental Establishment, Boscombe Down, made a free-fall jump from a Hercules flying at 41,380 ft, opening their parachutes at 2,600 ft.

In every particular apart from the number of para'troops that can be carried (70 in the Beverley, 62 in the Hercules) the new American-produced aircraft considerably outweighs the British equivalent. When comparing the figures for performance and capacity it is also interesting to note that both the Hercules, and the Beverley it replaces, were roughly contemporaries in their original stages of development. The first flight of the Hercules took place in April, 1955, whereas the first production Beverley took the air in January of the same year. The Beverley entered squadron service in March, 1956, and the Hercules in December.

One may argue that the British Air Staff were wrong in going for the Beverley in the first place. The aircraft has not been developed in the same way as the Hercules and now this aircraft has replaced the Beverley in the RAF. It can be admitted that the Hercules has been considerably developed with more powerful engines and performance but the amount of cargo or troops that can be lifted has changed little over the years.

It is always upsetting to have to purchase an aircraft manufactured by another country when our own aircraft industry is capable of producing the same thing. Perhaps the fault, if there be any, lies with the planners in not realising the usefulness of the turboprop engine when the Beverley was first conceived.

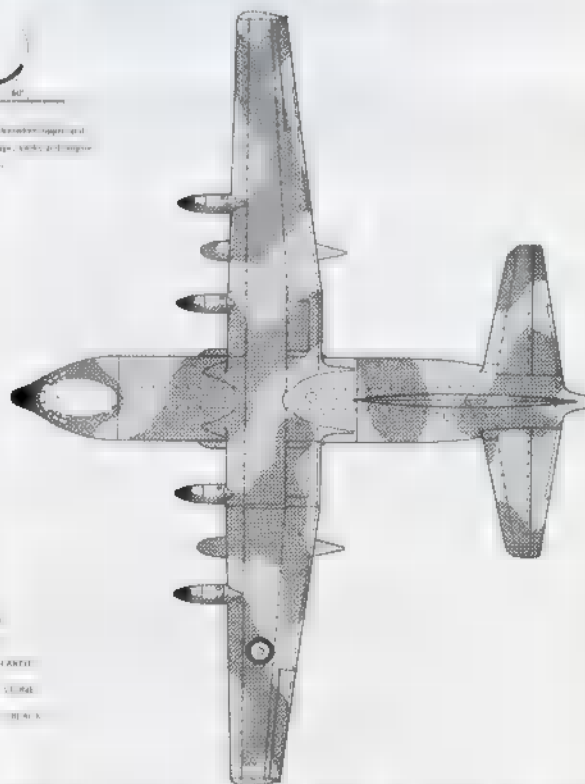
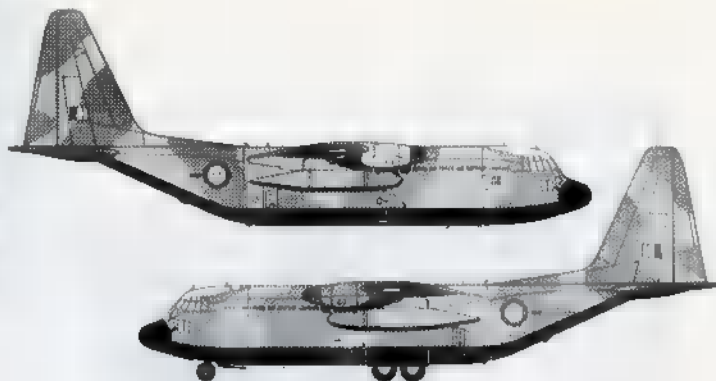
Whatever the arguments the aircrew are very pleased with the Hercules. Even though the RAF are virtually the last overseas country to have the aircraft on strength, it will provide a most acceptable and useful addition to Air Support Command's all-jet fleet.

Aircraft of No 36 Squadron seen at Lyneham were: XV181, '191, '192, '193, '194, '196, '197. XV190 has been seen there but this and the other aircraft making up the nine for the squadron's full strength were away on route proving.



# RAF HERCULES COLOUR SCHEME

Drawings by A. M. Alderson  
Notes by Michael J. F. Bowyer



■	RED	■	BLACK
■	WHITE	■	LIGHT GREY
■	BLUE	■	NAVY BLUE
■	GREEN	■	YELLOW

Number 36 Sqn took on charge its first C-130K Hercules at Lyneham on August 1. The first Hercules for the Royal Air Force reached Cambridge on December 19, 1966, in natural finish and wearing RAF roundels and fin flash. On the morning of February 18, 1967 this machine XV177 made its first flight in the brown and black colour scheme decided upon for these aircraft. Since then deliveries have built up and about 100 Hercules C1 are now in this country. They are fitted with British radio and are painted at Cambridge under exacting conditions with long-lasting Polyurethane paint.

Much interest has been aroused in the new and somewhat unusual paint scheme and so, a few days after the first Hercules reached the RAF, we visited the squadron to gather material for the drawings of the Hercules which accompany this feature.

XV177 and XV178 were set aside for AEE trials, after which came the Hercules bearing the white legend ROYAL AIR FORCE TRANSPORT COMMAND on the sides of the nose. Initial deliveries began either to the MU at Colerne or to OCU at Thorney Island. With the change to RAF Air Support Command the nose legend was accordingly altered and is to be retrospectively applied to earlier aircraft. The intention is to operate these machines mainly in Britain as replacements for the Hastings. Aircraft 1, 3-22 and 35-86 will carry the nose legend ROYAL AIR FORCE AIR SUPPORT COMMAND, whereas nos 23-34 already being delivered (ie, the batch from XV197) will bear the nose legend ROYAL AIR FORCE FAR EAST, and will be for 36 Sqn.

With the co-operation of RAF Air Support Command and very kind assistance from Marshall (Engineering) Ltd of Cambridge we are able to present the very detailed accompanying drawings of the camouflage pattern as specified for the RAF Hercules. Two interesting points will be noted. One is the proportion of the underwing roundel, and the other is that the underwing serials hitherto accepted as off-white are specifically light grey. This renders them hard to read and reduces any

possible reflection in searchlight beams. The aircraft are in glossy finish when they leave the works, and it has been found that the glossy black in fact gives more protection at night than the matt finish. Nevertheless in some hands the aircraft finish appears to be losing its high gloss.

XV191 illustrated the machine at disposal for inspection when in the hands of 36 Sqn. XV179 on public display at Abingdon in September had '179' in white characters on the side of the nose, a feature of OCU aircraft. Digits were 10 inch high. XV187 has acquired, in some hands, a narrow red dayglo strip down the fin leading edge, mid-placed and about a foot long.

The following notes apply to the Hercules as delivered to the RAF. It remains to be seen how much the paint scheme becomes modified.

**Roundels:** Fuselage and above port wing—red 18 inch diameter, white 18 inch diameter, blue 54 inch diameter. Under starboard wing—red 18 inch diameter, blue 54 inch diameter.

**Fin flash:** 36 inch x 24 inch high, colours equally divided.

**Serial No:** Fuselage, characters 8 inch high, 5 inch wide 1 inch stroke, 1 inch spacing. WHITE. Under wings, characters 10 inch high, 22 inch wide, 4 inch stroke, 3 inch spacing. LIGHT GREY.

**Camouflage designation:** ROYAL AIR FORCE AIR SUPPORT COMMAND or ROYAL AIR FORCE FAR EAST, characters 8 inch high, etc. WHITE. **Aircrowns:** 6 inch at tips golden yellow.

**Walkway boundary:** 1/2 inch diameter dots at approx. 24 inch pitch. CANARY YELLOW (shown black on drawing).

**Walkway:** Matt, non-skid finish, including roundel.

**Engines:** Camouflage pattern identical on all nacelles.

**Tanks:** Camouflage pattern identical on tanks and pylons. Also identical on inboard and outboard sides.

**Leading edges:** Upper surface camouflage continues to line 6 inches back from leading edge of mainplane and tailplane on underside.

# THE CHURCHILL TANK

by  
Peter  
Chamberlain



## PART 5

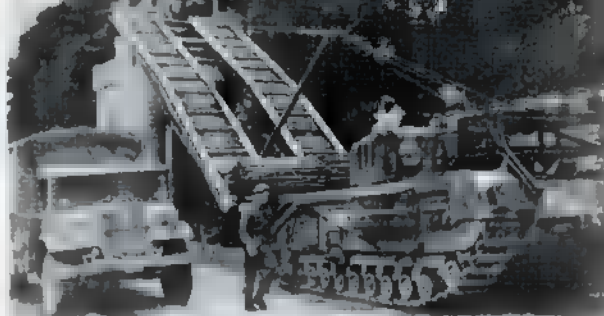
### AVRE VARIANTS

CHURCHILL AVREs equipped the 5th Assault Regt, RE, the 6th Assault Regt, RE, and the 42nd Assault Regt, RE, these regiments together forming the 1st Assault Brigade, RE, for the invasion of Europe in June, 1944. As finalised, the AVRE design allowed for the fitting of numerous special devices and equipments for tackling the obstacles and defences likely to be encountered by the armoured units of 21 Army Group. The many variants are summarised here:

**Mk II SGB AVRE:** This device was evolved by the Canadian Army in April, 1943, as a method for wall or ditch crossing in assault. A standard box girder bridge was fitted to the front of the AVRE and adapted for quick release. For this conversion of the chassis, the holes in the inner horn plates for the Hollebone drawbar eyes were burnt out and bushes of 3 inch bore welded in to take the pins of the SGB bridge bracket. This bridge weighed four tons, was 34 feet long and was controlled by a winch mounted on the rear of the vehicle. The bridge could surmount a 15 ft wall or span a 30 ft gap. Fascines (brushwood bundles) were often used in conjunction with the SGB bridge. To enable AFVs to climb over high obstacles, the AVRE released its bridge at an angle, against the obstacle and then withdrew. A second AVRE carrying a fascine climbed to the top of the bridge and dropped its fascine over the side of the wall, this broke the fall of the AVRE as it followed the fascine over the wall.

**Fascines:** These were developed for ditch crossing and consisted of brushwood bundles of two types, 6 ft and 8 ft in diameter, and 11 ft long. They were carried on the front of the tank, supported by a wooden or steel cradle and could be jettisoned by a quick release mechanism which was operated by a line led inside the tank through the cupola. In most cases a crew man had to expose himself to give directions to the driver, so experiments were carried out with periscopes similar to those used in the DD tanks, these were 6 ft and 8 ft in size and were fitted to the commander's cupola to permit the commander to see over the fascine. Trials were carried out late in 1944 with these periscopes but later cancelled with the event of new types of fascines which gave a better view ahead.

**Towed Standard Box Girder Bridge:** The towed SGB was a normal SGB assault bridge mounted on a detachable two-wheeled axle and trailed behind the AVRE by a detachable towing hook. This was a method of taking a SGB bridge



*Churchill AVRE with SGB. SGB Mark II bridge showing sheerlegs, purchase, and winch at rear. Note 79 Amd Div markings (Canadian Official photo).*

over a long distance without placing strain on the AVRE, also improving the vision of the driver and therefore increasing the speed of the tank, and making it possible to pass under low bridges. The bridge when required could be picked up by an AVRE with SGB brackets, winch, and crane.

**AVRE with Folding SGB Assault Bridge:** This device was a normal SGB assault bridge which had been modified so that it folded in the middle. The rear end of the bridge was attached to the AVRE in the normal manner. In the carrying position the bridge was folded and lashed together by cordage, which was cut before lowering. When launched the bridge was lowered by releasing the winch brake and the bridge opened itself as it was lowered, this opening being effected by two fixed cables that pulled on a curved cable frame attached to each side of the far half of the bridge.

**Dumbell Fascine:** Various types of fascines were experimented with; one type known as the Dumbell Fascine was constructed with bridging cribs and chespalé bundles to form the shape of a Dumbell. The weight of this was 2½ tons, length 12 ft and diameter 8 ft 6 in.

**Moyens Fascine Launcher:** This was an attempt to develop standard fascine equipment suitable for all tanks, by mounting the fascine on the turret instead of on the bow. A simple steel framework was fitted to the turret of the AFV, this supporting the fascine. The whole assembly could be traversed by revolving the turret.

**Mat Laying Devices:** These were evolved for laying rapidly and—if necessary under fire—a carpet in a lane over poor ground and over barbed-wire obstacles for trucks and infantry.

One such device was first tried out at Dieppe; this had a small bobbin fixed to the front of the Churchill, but with no side arms. Prior to the invasion of Normandy, aerial reconnaissance had shown that some beaches had strips of blue clay in which vehicles would bog. A similar beach was found at Brancaster in Norfolk and a special trials wing established there. As a result of these trials a proportion of AVREs were equipped with Bobbins on which was wound coir and tubular-scaffolding carpets.

The types used in Normandy were Bobbins Mk I and Mk II, which had been developed by the 79th Armoured Division at Brancaster. They both carried a mat 9 ft 11

**Below:** AVRE with fascine showing release line led into cupola and wooden cradle. This is an unarmed AVRE used for training.







Above, left to right: Churchill AVREs with Moyens Fascine Launcher, Plough A (OAC Mk I), and Jeffries Plough. (All photos except heading courtesy Imperial War Museum).

inches in width but the Mk I carried longer lengths on movable arms. Operating speed was 2 mph, and the bobbin could be jettisoned by a small charge.

**TLC Laying Device and Carpet:** This device consisted of a reinforced Hessian carpet wound on to a horizontal reel and carried above the ground, across the front of the Churchill by fixed side arms attached to the vehicle. Its primary object was to enable wheeled vehicles and infantry to cross barbed-wire obstacles. On meeting such an obstacle the weighted free end of the carpet was dropped on to the ground whilst the tank ran on to the free end, and then the carpet automatically unwound itself, so that the vehicle ran over it across the obstacle. On completion of the crossing the device could be jettisoned. This device was first tried out in March, 1939, on a Cruiser Mk I (A9) further trials being carried out on a Matilda II tank and a Universal Carrier. Development of this device for fitment to the Churchill began in April, 1942, the pilot model being tested in July. Production completed by the end of 1944.

**TLC Laying Device and Carpet (Fascine Type):** Developed in 1940, this device was designed for rapidly laying a carpet in a lane over poor ground breached through a minefield. It was intended to be used for wheeled traffic only, but in emergency could be used by tracked vehicles. The carpet consisted of coir-chesepale with 2 inch tubular reinforcement, 11 ft wide and 100 ft long. The carpet was tightly reeled in the shape of a fascine and mounted on a modified steel fascine cradle in a manner similar to the normal fascine. The carpet reel was held on the cradle by a set of travelling cables, and a reel spindle securing cable. The reel when released rotated on an axle through which the spindle securing cable was threaded. The carpet skidded out from underneath and dropped under the tracks of the AVRE. Laying speed was 5 mph.

**AVRE with Log Carpet Device:** The carpet consisted of 100 logs each 14 ft long with an average diameter of 6 to 8 inches joined together by 2 inch wire rope. It was mounted on a steel frame on top of the AVRE. This framework consisted of Decauville Track fitted in sockets on the side of the AVRE, six on either side. The superstructure could be removed when not required. To release the log mat a series of small charges were fired, these cut the cables holding the mat on the frame. Laying speed was 2 mph.

**Twin Bobbins:** This device was two small bobbins of Hessian and chesepaling on a horizontal spindle carried across the front of the vehicle by fixed side arms attached to the tank, similar to the TLC devices.

## MINE PLOUGHS

For mine clearance in assault in areas where the exploding of the mines would crater the ground and render it impassable to traffic, a form of tank-propelled plough was evolved which could uproot and sweep the mines aside so that they could later be collected and rendered safe by sappers. Various types of ploughs were developed and experimented with, having mixed combinations of ploughshares and rollers. One such equipment, the Bullshorn Mk III, was used successfully by the 5th Assault Regt, RE, at Lion-Sur-Mer, where they cleared the minefields on the beaches and between the

houses on the sea front.

**Bullshorn Ploughs:** Consisted of ploughshares mounted on a girder frame set in front of the vehicle. Variations existed of this equipment. Bullshorn Mk III was evolved in March, 1944, by the 79th Armoured Div. The weight of this plough equipment was 11 cwt 2 qtrs, operating speed 4 mph and the area cleared 2 ft 9 inches, this being the tank track ground only.

**Jeffries Plough:** This was similar to the Bullshorn Plough.

**Plough A (OAC Mk I):** Consisted of a combination unit of ploughshares and twin rollers, each unit positioned in front of the tank track. The two units were attached to a girder frame, this frame having a counter-weight structure.

**Plough B (Bullshorn Mk II):** Consisted of a large centre curved plate flanked either side by a ploughshare, the whole assembly being mounted on a girder frame, with the side arms of the frame counter-weighted.

**Plough C (OAC Mk II):** Similar to Plough A but the units of twin rollers were replaced by two heavy rollers, and the counter-weight girders were replaced by weights.

**Plough D (Atherton Equipment):** This was made up of two ploughs attached to a heavy short girder frame which was controlled by a Atherton jib crane mounted at the rear of the tank.

**Farmer Front:** Developed in mid-1943, it was designed for fitment to the Churchill by means of the same brackets as used for the AMRCR. The device consisted of 19 tines in arrowhead formation in front of the tank, the framework supported by three 3 ft wheels and two 4 ft 6 inch wheels.

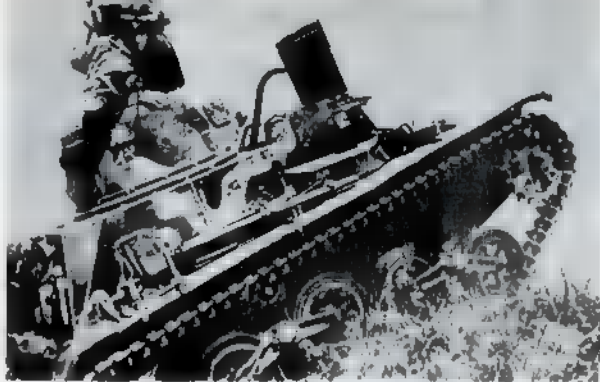
**Farmer Track:** This was developed in late 1943. The frame of this device was attached to the Churchill in the same way as the main top frame of the Farmer Front. Its weight was taken at the forward end by two 5 ft diameter wheels, 15 inches wide within the frame, one in front of either track. In front and as close as possible to each wheel were 6 curved tines positioned in arrowhead formation.

**Farmer Deck:** The frame of this device was of lattice construction and a short plough was positioned in front of each track. The whole assembly was counter-weighted either side of the vehicle by a heavy girder.

**Farmer Deck IIIA:** This device was developed in August 1943, and consisted of two large ploughshares mounted, one in front of either track in a frame pivotally connected to the tank at the rear and supported at the front on rollers.

**Below:** Churchill Farmer Front showing arms fitted to the standard AVRE attachment points. **Bottom:** Churchill TLC Laying Device and Carpet.





# A Japanese tankette

**Left:** Easiest Japanese tank to scratch-build is the Type 92 tankette. Colour scheme of this example is random patches of straw yellow, green, and brown.

**M**ANY Japanese tank types are of a complicated shape for scratch-building and there is also a dearth of scale drawings, so most military modellers have probably made do without Japanese tanks to go with their Airfix Japanese infantry. For anyone who wants to try his hand, however, the easiest of all Japanese tanks to build up from scratch is the diminutive Type 92 tankette which makes a delightful and characteristic model in 4 mm scale.

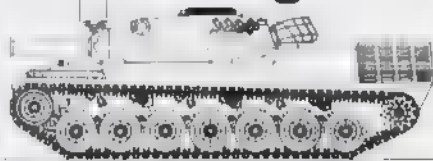
The Type 92 tankette dated from 1932 and remained in service for the first half of the second world war. It was derived quite closely from some British Carden-Lloyd light tanks which the Japanese had purchased for evaluation, so dimensionally it was very similar to the Bren gun carrier which stemmed from the same source. The model, therefore, utilises the Airfix carrier chassis, but because the Type 92 had an extra roadwheel, you'll need to utilise the spare wheel (part 14) from the carrier kit, plus a further spare wheel from a second kit.

Construction starts off with the suspension, which is altered quite drastically as shown in drawing A. Using a craft knife carefully cut away the double and single bogies from carrier parts 17 and 18 and then cut and file away the suspension arms and springs from these bogies, *very carefully*, so that you are left with separate wheels. Now, using drawing A as a pattern, carefully bend each track to the new shape with the top run sloping to the rear. I found that, after bending, the tracks held their new shape long enough for the wheels to be added, but if the track should snap, don't worry as it can easily be re-cemented.

The three original road wheels, plus the spare wheel are now cemented back to the lower run of the track in pairs to match the drawing, and the suspension arms are cut—two for each side—from plastic card and cemented from hub-to-hub on each pair of wheels. Next take some sprue or plastic rod of the correct diameter and cut four

## Military Modelling

by  
**Chris Ellis**

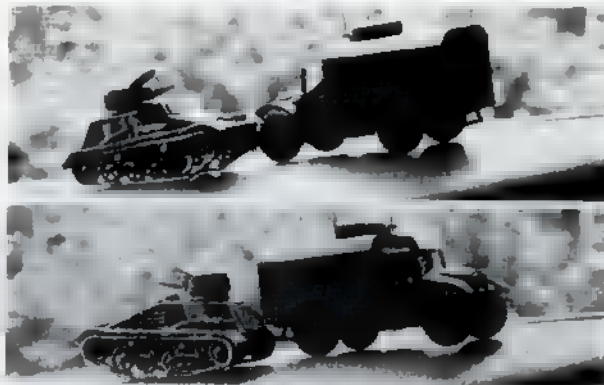


slices to represent the return rollers. These are cemented under the top run of the track, two each side.

The chassis is made up from parts 1 and 2 of the carrier kit cemented together in the usual way, and with the transverse rear rib and side locating ribs filed away entirely. The modified track and suspension assemblies are now cemented to the chassis, and it will be noted that the new shape of the tracks causes the chassis to 'sit' towards the rear. Drawings A and B between them show this sloping attitude which the track and chassis will take up, and I've drawn in a datum line to enable you to check that all is well so far. Once all is cemented to your satisfaction, the cylindrical spring covers can be cut from suitable plastic scrap and cemented to the chassis sides between the return rollers.



**Above, left:** The tankette under construction with turret made from top cover of Bic pen. **Right:** The Morris Radio Truck showing simple box body construction, floor, and rear wheel arches.



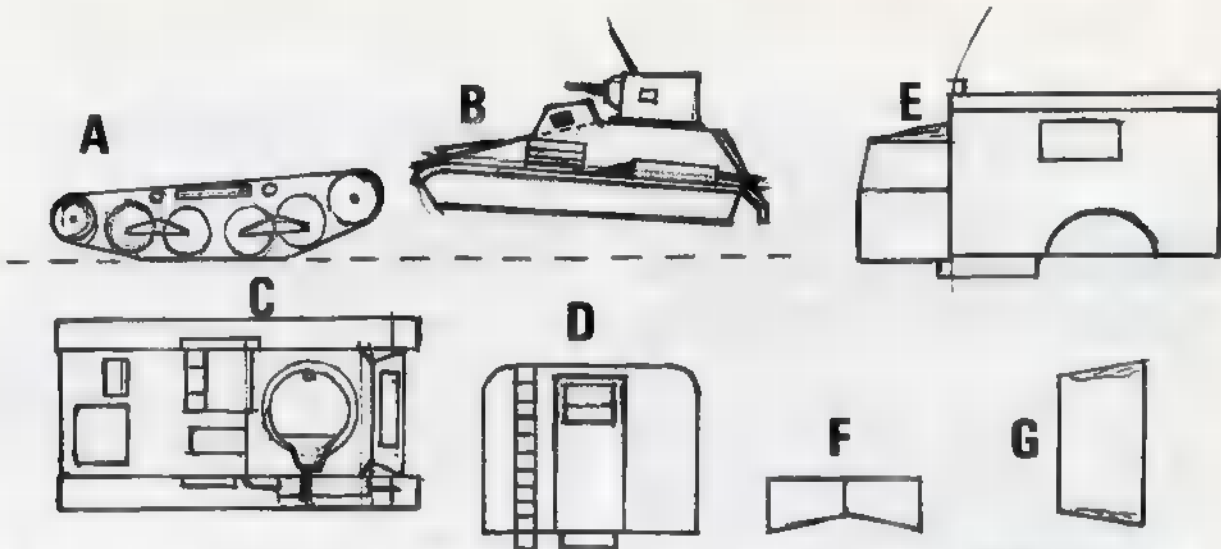
**Above:** Left and right hand views of the Type 92 tankette and Morris Radio Truck models. Study these views in conjunction with the drawings.

As scratch-building goes, the superstructure is quite plain sailing. Working from the drawings, start by cutting out the right and left sides as single pieces from plastic sheet. These are identical except for the driver's cabside which is omitted on the left side. The side pieces are cemented on the chassis top where the carrier sides would have gone. Next is the long sloping front, the hull top, and the hull rear, which are all cut out individually and cemented in place to form the basic box of the hull. The only tricky parts are the triangular shaped rear corners. These are also cut out separately and added after the rear face—which slopes towards the top—has been added. Also required are a lower hull front and rear which cover the original ends of the carrier chassis. The driver's roof, and the left side, front and rear of his raised 'cab' are added after the basic hull is complete. Note that there is a vision flap on the front.

Remaining hull details are the two access hatches on the

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sloping hull front and the raised section on the left front which—on the real vehicle—was the cover for the side-mounted engine. On the left hull side is a radiator grill made up from thin overlapping strips of thick paper, an exhaust pipe, which I bent up from soft copper wire, and a silencer which is easily made by wrapping gummed parcel strip round the wire exhaust pipe. These details are clearly shown in drawing B. On the right hull side is a 10 mm box on the track cover adjacent to the driver's compartment, clearly shown in the prototype picture. Finally there is an access plate 7 mm deep on the hull backplate, and vision flaps from scraps of card on each side of the driver's cab. I also added a pickaxe and a starting handle, bent up from wire.

Lastly cut a disc of thick paper and cement it on the hull top—dimensions and position from the plan view—to depict the turret ring. The turret can be made very quickly simply by sawing the bottom off the top cover of an old Bic ball pen, again taking the depth from drawing B. The stump of the plastic pocket clip is then filed down to represent the ball mounting for the 6.7 mm machine gun—made from scrap or wire—with which this vehicle was armed. Vision flaps are added to the turret sides and rear, and the circular hatch is cut from plastic card. I added a plastic card bottom to the completed turret, then drilled it and the 'turret ring' on the hull top to take a pin as a pivot.

Remaining drawings and pictures show a very simple but attractive conversion for the Airfix Quad kit, the end product being a Morris 4 X 2 Radio Truck. Chassis modification involves filing new locating notches for the front axle in the chassis members 4 mm in front of those moulded in the kit. The rear axle goes in its original position, but all the locating notches must be filed right through to the vehicle floor to make this model sit lower on its wheels than the Quad does. The projecting sides of the floor are cut away completely, and the bonnet sides are cut from the Quad sides. The bonnet is then assembled in the usual way, and seats and steering wheel are fitted. The box body is made up from plastic card, face by face, with a floor and the rear wheels boxed in to prevent daylight showing through. The constructional picture should make this clear. I made the curved roof from card bent round a pencil. A length of railway signal laddering goes on the rear, the spare wheel on the roof, and a plastic card bracket holds the single aerial. Front mudguards are used straight from the kit with a thin rod of scrap plastic or heat-stretched sprue cemented across the radiator as a front support. Side doors are from plastic card and the canvas cab roof from card bent down at the edges.

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**Above:** A—Pattern for Type 92 track and suspension. B—Side elevation from left. Driver's cab on right side, left side outline dotted. C—Plan view, turret traversed left. Note triangular corners of rear hull. D—Radio Truck rear end; body front same but less door, ladders, and with half depth window only. E—Radio Truck side. F—Radio Truck windscreen, from clear sheet. G—Cab roof; also pattern for cab floor. All full-size for models. **Right:** Prototype Morris Radio Truck. (Photo D. G. Potter).



## ARE YOU A KIT CONVERTER?

We have many letters from readers requesting back copies of AIRFIX MAGAZINE containing conversion articles. ■ copies ■ issues ■ still available for the benefit of ■ who may have missed or mislaid earlier editions. For example, here ■ some ■ the practical articles which have appeared.

**1965: September** — Jeep conversions and Battle of Britain colour schemes. **1966: July** — RF-4C Phantom conversion. **September** — Matador variants. **November** — Sturm-tiger conversion. **1967: May** — Crimean War and Do 217 conversions. **June** — Mosquito profile. **July** — Soviet missile tank. **August** — Early Churchills. **September** — Avro York model.

Would readers please note that all issues not listed above are now out of print and can no longer be supplied.

Back copies cost 2s each (including postage) for all copies up to and including September, 1966. From October, 1966, the cost is ■ 6d an issue, post paid. Please address all requests for back copies, together with your remittance, to our circulation department ■ SURRIDGE DAWSON & CO (PRODUCTIONS) LTD, PUBLISHING DEPT, 26 ABERDOUR STREET, LONDON SE1.

# NEW BOOKS

## REVIEWED FOR MODELLERS

### Island lines

**ISLE OF WIGHT ALBUM**, by G. M. Kichenside. Published by Ian Allan Ltd, Terminal House, Shepperton, Middx. Price 30s.

THIS is an excellent book, largely photographic in content though there is a route map and an informative potted history and description of the Island's railways. There are nearly 190 photographs covering a variety of periods all of very good quality and beautifully reproduced. The illustrations have been 'themed' and intelligently grouped so that it is relatively easy to find one's way, though we can't help feeling that page numbers would have enhanced the book's reference value. Despite this lapse it can be unhesitatingly recommended.

**RAILS IN THE ISLE OF WIGHT**, by P. C. Allen and A. B. Macleod. Published by George Allen & Unwin Ltd, Ruskin House, 40 Museum Street, London WC1. Price 45s.

IN comparison with Ian Allan's book this is more expensive but well worth having for the extra information the book contains. There are not so many photographs, though most of them are large and there are two very fine colour plates. Four appendices give detailed notes and tables on rolling stock, signalling, gradient profiles, etc, the latter including track diagrams, positions of bridges, signal boxes and all civil engineering features.

It is however the excellent text that makes this book. The authors relate a lot of information about day to day incidents based on personal observation as far back as 1914 and their writings are vivid and full of atmosphere. A. B. Macleod was in charge of the Island's railways in 1928-1934 and no one could be better placed to recount the momentous changes that took place during this period and the effect they had in years to come. The 'Afterthoughts from Ryde Pier' by Hamilton Ellis are also a particular delight to read. The book does not set out to be a history but it does make for very interesting reading and it will give pleasure to the hundreds of enthusiasts who knew and loved the Isle of Wight's railways.

### Lifeline in railways

**REFLECTIONS ON A RAILWAY CAREER—FROM LNWR TO BR**, by J. M. Dunn. Published by Ian Allan Ltd, Terminal House, Shepperton, Middx. Price 25s.

A RAILWAY enthusiast all his life, the author began his railway career at Willesden locomotive shed erecting shop as an apprentice in 1913. He worked with locomotives in running sheds on the LNWR, later LMS and later still the Midland Region of BR at Abergavenny, Tredegar, Blaenavon, Coventry, Nuneaton, Llandudno and Bangor from where he retired as shed master in 1958.

He writes with a candour and frankness seldom found in railway books and many railfans will no doubt be surprised at some of his revelations. All will appreciate the detail he relates and the fascinating insight he gives of conditions, equipment, day to day operations and the personalities and

locomotives with which he worked and came into contact. Several interesting photographs and sketch maps help readers to follow the text.

### Steam traction

**TRACTION ENGINE PRINTS**, by Anthony Beaumont. Published by The Oakwood Press, Tandridge Lane, Lingfield, Surrey. Price 8s 6d.

THE main interest in this collection of fifty traction engine illustrations is that they have been painstakingly copied from old and rare catalogues, thereby enabling many examples of engines to be illustrated that no longer exist to be photographed today. The author has made a balanced selection covering a variety of manufacturers, types and periods but ever conscious not to duplicate that which has already been published elsewhere.

### Colonial past

**THE 9 PDR MUZZLE LOADING RIFLE**, by Capt John D. Chown. **HIGHLAND MILITARY DISCIPLINE OF 1757**, by George Grant. Price 10s 6d each, plus 6d postage each.

**THE FRENCH ARMY IN AMERICA**. Price 21s, plus 10d postage. All published by the Museum Restoration Service, Ottawa, Canada, and available in Britain from Ken Trotman (Arms Books), 3 Ash Close, Naphill, High Wycombe, Bucks.

PUBLISHED in Canada, these are three interesting paperback books for the 'horse and musket' military enthusiast. Taking them in turn, the first deals with the standard 9 pdr field gun which was the standard British field artillery piece in the last quarter of the 19th century. As such it was as well known in warfare as the 25 pdr is today, and readers will recall that details for modelling a 9 pdr were given in our recent Zulu War series. There is a Canadian flavour to this book because it deals with its employment by the Royal Regiment of Canadian Artillery but, in fact, the salient points about the weapon were the same anywhere and the book makes a splendid little 'manual' on this famous gun. There are numerous interesting pictures, some dating from the 1890s and some excellent scale drawings reproduced from the original handbook. Gun drill, sights, breech cyphers, and ammunition are among the aspects covered, as well as full details of the gun and limber. Also included are sledge mounts for winter conditions. There is a great deal here for modellers interested in 'colonial' wars.

The second book is more esoteric, being in fact a reprint of the drill manual for Highland regiments of 1757. In addition there is an eight-page modern introduction giving the background to the period and the organisation of Highland regiments (mainly in the Canadian Army) in the 18th century. This includes pictures of the weapons and uniforms of the time. Those who go in for a detailed study of military history will find a great deal of interest in this book.

Last of the trio is very much in the same vein, this time incorporating a reprint of the original plates and text of *Exercice de l'infanterie françoise*, the drill book of the French regular army at the time some of its regiments were serving in Canada in 1755. Like the Highland book, this publication has lots of fascinating old engravings showing all the drill movements and positions—everything from presenting arms to re-loading. There is an introduction with some excellent pictures giving the background to the period. Overseas readers will be pleased to know that this book is bilingual throughout with text in French and English. All these books are obtainable on order only, and there is a waiting time of about five weeks.



## War in the desert

ALAMEIN AND THE DESERT WAR, edited by Derek Jewell.

Published by Sphere Books, price 7s 6d.

**M**ANY books have already been written covering the classic campaigns in North Africa during World War 2, and this, the latest in the field, will make a splendid little 'primer' for military enthusiasts who want full coverage of the campaign at minimum cost. Basically, the contents include the complete series of articles which appeared in the *Sunday Times Magazine* during September of this year with additional material and many more photographs. There are chapters on weapons, the generals, the course of the campaign itself, the Long Range Desert Group and a detailed account of the Alamein battle specially written for the book by Viscount Montgomery.

Of particular interest are several pages of battle maps and some aspects of the desert war which are not normally found in military history books. For example, a complete section of the book is devoted to the 'fringes' of the battle such as war-time life in Cairo, the story of 'Lily Marlene', the forces' newspapers, army slang, and even some amusing stories of the Arab camp followers. Numerous colour pictures make this book excellent value for its modest price.

## Bellona Prints

BELLONA PRINTS—SERIES 13, Published by Merberlen Ltd, Hawthorn Hill, Bracknell, Berks. Price 4s, postage extra overseas.

**M**OST recent release in the Bellona prints series constitutes quite an improvement on anything this firm has previously published. While the policy of presenting 1:76 scale tank drawings is adhered to, the actual amount of text and pictures has been increased. Main subject is the Tiger Mark 1, which is drawn in both early and late production versions, with a detailed history, the medium M4A3E2 assault tank version of the Sherman with its very thick additional armour, and the A30 Challenger.

## New Profiles

AIRCRAFT PROFILES 168-186, Published by Profile Publications Ltd, Great Bookham, Surrey. Price 2s each.

**S**INCE we last included a review in these columns, the Aircraft Profiles, in particular, have included numerous releases of particular interest to modellers. Among these titles for which corresponding plastic kits are available we would specially recommend the Ju 52 (177), the Boomerang (178), Javelin (179), Caravelle (180), Catalina (183), the Yak 9 (185), Canadair Sabre (186), Bf 109F (184), and the Leo 45 (173). All these are packed with the usual excellent colour drawings and detail pictures which are invaluable for finishing models in colour schemes other than those suggested in the kit, and many of them also give useful variations on the basic design—for instance the Ju 52 covers virtually all the variants and includes mine-sweeping and numerous civilian types. Likewise, the Catalina Profile is an absolute 'must' for anybody making the Airfix model. Of special interest to converters are the Avro York (168) which features ten different colour schemes and we would particularly commend this to anyone attempting to make the York model we described in our September issue. Similarly the Hawker Hunter two-seater Profile (167) gives masses of vital detail and no less than 25 different colour schemes for anyone who wishes to convert the Airfix Hunter to this configuration.

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# The earliest Jet Provost

ALAN W. HALL CONVERTS THE  
AIRFIX MK3 TO A MK1

**N**OW that pilot training in many air forces throughout the world has been standardised on jet aircraft from start to finish it is sometimes difficult to realise that the RAF started this trend as long ago as August, 1955. The first course to train entirely on jet aircraft was held at No 2 FTS Hullavington in that year and the aircraft used was the Jet Provost T1.

This makes the first mark of the now famous JP a really historic aircraft. Only ten were built and of these about half went to the Central Flying School at Little Rissington. Four of the CFS batch, XD675-678, were given a distinctive red and white colour scheme and took part in the SBAC flying displays at Farnborough in 1958 and 1959.

The differences between the two marks of aircraft are fairly considerable. The JP Mk 1 was after all a direct crib on the piston Provost and apart from almost identical wings, canopy and tail unit employed many internal bits and pieces from the earlier aircraft.

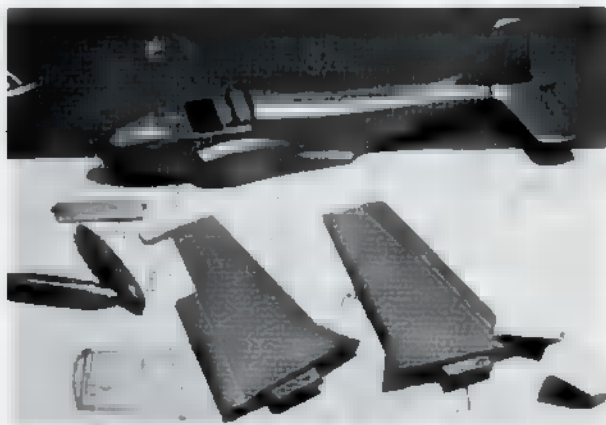
On close inspection the modeller will find that there are differences in the canopy, wing tips, undercarriage, tail unit and rear fuselage which is sufficient excuse for anyone to start converting.

**STAGE 1** Kit instructions are followed for the build-up of the fuselage, wings and tail unit. Assembly is continued up to putting the tail unit on to the fuselage but the wings are left off for the initial stages. Remember to load the nose of the aircraft with lead before sticking the fuselage halves together.

**STAGE 2** Once dry the fillet from the fin to the fuselage is removed with a sharp knife. Although the fuselage plastic is fairly thick at this point it will leave a small hole after the fillet has been removed and this should be filled with body putty and laid on one side to dry. At the same time attention can be given to the rather poor joints of the tailplane to the fuselage. These can be given a liberal coating of body putty and sanded down when dry. The rear fuselage also needs attention as its shape is slightly curved from the JP Mk 3 shape. Reference should be made to the plan for this and the revised shape sanded away with wet and dry paper.

Continued on next page

**STAGE 3** Whilst the fuselage is drying out attention can be paid to the wings. The tip tanks are first cut off after the wing halves have been stuck and dried. Make the cut so that a tiny sliver of the wing next to the aileron is left as this helps as a key when the new wing tip is added. A very fine saw will be needed for this task. Glue into position a tiny piece of balsa 1/16 inch thick (or alternatively plastic card) on each wing tip and before putting the wing aside to dry fill the holes under the wing surface, meant for rocket attachments, with body putty.



**STAGE 4** Returning to the fuselage rub down the body putty around the tail unit and using the same 1/16 inch balsa, make the under fuselage strake which runs from just aft of the wing trailing edge to the jet orifice. This should be stuck in position and when dry the whole area coated with a solution of clear dope and talcum powder before finally sanding.

**STAGE 5** Work on the wings in a similar manner sanding down the tips and the body putty covering the rocket locating points. Add the ailerons and coat the tips with talcum powder and dope. Once these have been rubbed down to a final polish the wings can be joined to the fuselage and allowed to dry.

**STAGE 6** The next and perhaps most difficult task is to reposition the wheel wells. Firstly the existing holes in the wing are filled with 1/16 inch balsa sheet where the wider parts exist. This leaves a long rectangular shape for the lengthened undercarriage legs. Next, with the use of a fine drill, bore holes in the central fuselage to correspond with the corners of the central undercarriage doors and carve out the shape with a sharp knife. Take care when going over the wing joint as the plastic is very thick at this point and unless you are careful an awful mess can result where the drill or knife hasn't been used with care.



**Above:** The four CFS Jet Provosts 1s which provide the subject for the scale drawing opposite (MOD photo). Picture bottom left refers to Stage 2 on page 95; remainder to the stages on this page.

**STAGE 7** The original canopy, or any part of it, cannot really be used for the Mark 1 aircraft. It is far better to cut a mould from balsa and start again. At this stage the cockpit detail can be added and ejector seats put in place. The canopy is moulded in the normal manner and to add a little more interest I cut the various sections out and made the finished product in the open configuration.

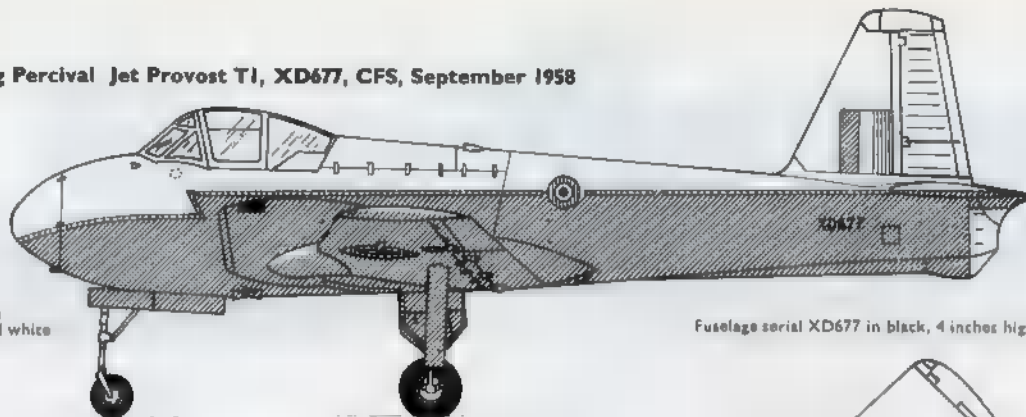
**STAGE 8** The undercarriage itself came from two other kits. I found all the pieces in my spare parts box and anyone trying this conversion should have a good look in their own before rushing off to buy new models just for the undercarriage legs. My solution to the problem, using the Corsair main legs and a Lightning nose wheel, is not the only combination that can be used. There are others. The Corsair legs had 1 inch cut off the tops, the strut moved to the side position and the 'V' shaped shock absorber cut off and shifted down to line up with the wheel locating stub. The leg fitted admirably into the original kit undercarriage locating hole. For the nose wheel I filed down the tyre so that a flat shape was achieved then cut the leg just above the wheel, removed the angled piece and rejoined the two parts after first of all filing a slot into the upper part. Before sticking the nose wheel in place I filled the forepart of the existing nosewheel housing area with body putty and sanded this down. No attempt to cut out the JP 1 wheel well was made as this would have resulted in the lead shot in the nose weight falling out. All undercarriage doors were made from plastic card.



**PAINTING & MARKINGS** Unfortunately the CFS Jet Provost team used two colours which are amongst the most difficult for modellers to apply. With perhaps the possible exception of silver, I find both red and white gloss paints very difficult to use and the only way round the problem is to have time and patience. By thinning down both colours and giving two coats at least, a reasonable final finish can be achieved. I masked out the red from the white having applied the latter first. Any slight deviations from the straight line dividing the two can be overcome by the thin blue line which separates them. Here I used Yeoman blue transfer strip cut to the required thickness. The ABT sheets which were more accurate in colour refused to cut to the thin line needed and had to be discarded. Wing roundels and tail flashes came from the original kit transfer sheet and the fuselage roundels were made from HisAirDec transfers. Fuselage serials came out smaller than the smallest Letraset and had to be hand painted.



Hunting Percival Jet Provost T1, XD677, CFS, September 1958

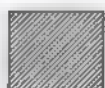


Natural metal orifice

Blue cheat line  
divides red and white

Fuselage serial XD677 in black, 4 inches high

All colours gloss



Bright Red



White  
(except where indicated)

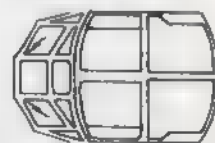


Blue



Black

Drawings by Richard L. Ward



Canopy plan

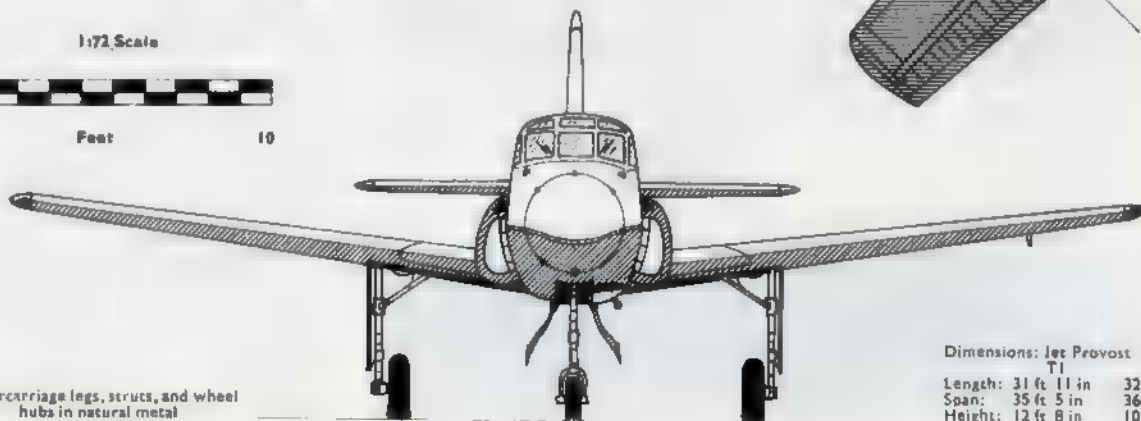
Note absence of underwing serials

Note: Other machines with identical  
colour schemes at CFS were XD675, '6, '8

1:72 Scale



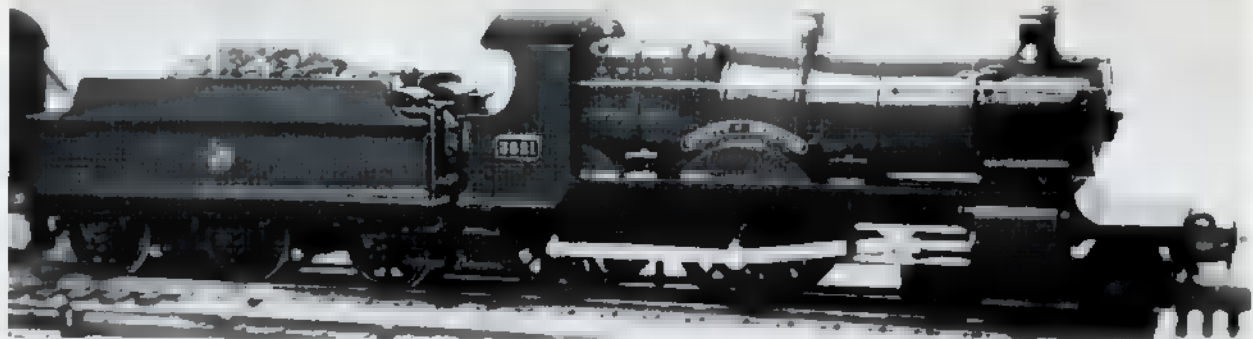
0 Feet 10



Undercarriage legs, struts, and wheel  
hubs in natural metal

Dimensions: Jet Provost  
T1 T3  
Length: 31 ft 11 in 32 ft 5 in  
Span: 35 ft 5 in 36 ft 11 in  
Height: 12 ft 8 in 10 ft 2 in

November, 1967



Handsome 'County' class conversion combines the Airfix City of Truro with Prairie Tank parts and uses a motorised tender. Boiler and firebox must be ballasted as described in our February, 1967, issue.

## 'COUNTY' FROM A 'CITY'

THE 40 locomotives that made up the GWR 'County' Class 4-4-0s had a relatively short life. They were built during the years 1904 to 1912 and the last one, 3834 *County of Somerset*, was withdrawn in November, 1933. They were always overshadowed by the 4-6-0s and they lacked the interest or long life enjoyed by the outside frame 4-4-0s. It is probably true to say that 3821 *County of Bedford* was more widely known from the fine 0 gauge model by Hornby than ever was the full size prototype.

The 'County' 4-4-0s are seldom modelled in 00 gauge but a fair model can be made using parts from the Airfix *City of Truro* and *Prairie Tank* kits plus odd pieces of plastic card. Basically it uses the boiler, wheels and tender from the *City of Truro* and the frames, footplate and cylinders from the *Prairie Tank*.

Figure 2 illustrates the amendments to be made to the *Prairie Tank* mainframes. The frames should be cut between the centre and rear coupled wheel axle and a 13 mm strip of 60 thou card inserted to extend the wheel axle and a 3 mm strip of taken with this operation to ensure all the axle holes are accurately lined up.

The coupled wheels are *City of Truro* coupled wheels with the extended axles cut off. If you did the 'Aberdare' conversion in the Septem-



BY NORMAN SIMMONS

ber issue you will already have these to hand. By using a hand drill held in a vice as an improvised lathe (described more fully with regards to turning lorry wheels in the *Matador* conversion in the October, 1966, issue) it is possible to turn down the large centre boss of the wheel with a  $\frac{1}{4}$  inch chisel and skim it down to the level of the spokes. The spokes can then be fretted out to bring them nearer to the centre of the wheel using saw blade, file and craft knife. The D shaped pins of the *City of Truro* eccentric cranks should be

**Below:** Another view of the model; motorisation details for the tender appeared in our last issue.

shortened so that the cranks fit flat against the wheel when the pins are inserted in the holes remaining in the wheel centres. The result is a reasonable inside frame driving wheel of scale size for the 'County'.

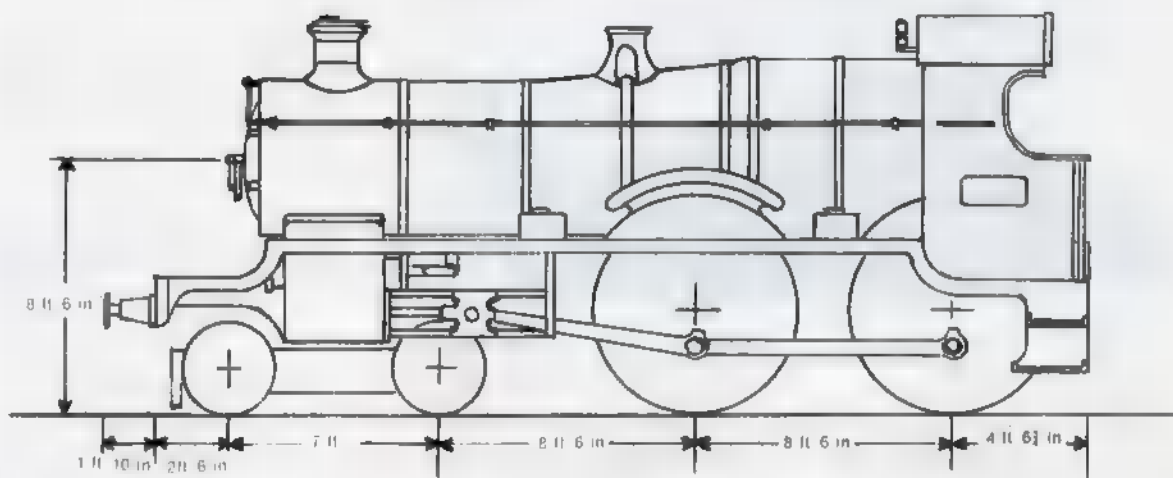
The axles inside the *City of Truro* driving wheels were not of course intended for inside bearings and they are in fact tapered. Rather than turn these down and make the axle straight, I found it easier to taper the *Prairie Tank* axle holes and I did this quite easily with the tapered handle end of a file. With constant checking for fit against each axle and a few twists of the file handle, the axles and axle holes were soon made a smooth running fit.

The footplate is modified in much the same way as described for the *Mogul* conversion in the May, 1967, issue except that all the *Prairie Tank* splashers should be removed. Do this carefully and the splashers can be used for the *Mogul* if you haven't done one already. The spaces in the footplate formerly occupied by the forward coupled wheel splashers should be filled in with plastic card and the remaining spaces opened out to 23 mm in length to accommodate the larger driving wheels of the 'County'.

The frame, coupled wheels, footplate and motion can now be assembled. The coupling rod is from the *City of Truro* kit and the connecting rod and the rest of the motion is from the *Prairie Tank* kit. They match up quite well. I found it necessary to drill through the eccentric crank pin holes to enable the pins to be inserted their full length into the wheel. Pins A from the *City of Truro* kit for the rear wheels required a No 56 drill and pins O from







GWR County Class 4-4-0  
Scale 4 mm to 1 foot (OO scale)

Fig 1

Add 8 mm strip of 60 thou plastic card

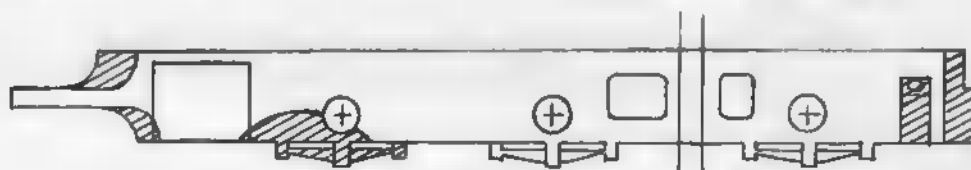


Fig 2 Showing modifications required to Prairie Tank mainframes. Shaded area shows parts which need to be removed.

the Prairie kit used for the forward coupled wheel required a No 55 drill. Provided the frames have been accurately extended, the wheels and motion should revolve freely.

The bogie frames were cut from plastic card and the axle holes drilled with a No 19 drill to take the *City of Truro* bogie wheels with their outside extended axles removed. The bogie stretcher from the *City of Truro*—part 17—was cut across the centre and reduced in width to 12 mm excluding the tongues, and slots were cut in the bogie frames to take the tongues. The bogie was assembled from these parts and fitted to the chassis by screwing it into a block of balsa wood cemented between the mainframes.

The coupled wheel splashers and sandboxes were cut carefully from the *City of Truro* footplate. The sandboxes were separated from the splashers and the splashers were reduced in height to fit as closely as possible to the wheels. The faces of the leading splashers were covered by 10 thou plastic card to mask the shallow groove which in the *City of Truro* is designed to take the outside springs.

Remaining construction was pretty straightforward. The cab was scratch built using 30 thou plastic card for the sides and two thicknesses of 10 thou card cemented together for the roof. The cab front used was from the Prairie Tank with the roof line trimmed to match the outline of the *City of Truro* cab front. Inside the cab the exposed wheels were boxed in with plastic card.

The combined boiler-firebox assembly needs little alteration. Handrails as previously described (February, 1967) should in preference be fitted. The lower part of the firebox needs to be cut or filed away to bring the boiler-firebox assembly down to the correct height above the footplate. The smokebox also needs alteration and Figure 1 together with the photographs will, I hope, show the shape of the new saddle which was achieved by carving the existing saddle to reduce its height and rearward projection, and building up the forward part with plastic card and plastic putty. The depression in the side of the boiler designed to fit round the *City of Truro* forward coupled wheel splashers needs extending and I found a  $\frac{1}{4}$  inch chisel ideal for this. A

reversing lever similar to that described in the 93XX conversion in the August, 1967, issue should be fitted to the offside.

## TENDER

Most of the time these locomotives were fitted with 3500 gallon tenders. Livery was of course GWR green and black and I believe all the class would have been lined out. Unfortunately time has not permitted me to add lining to my model or to build another 3500 gallon tender and I must apologise for the one appearing in my photographs—most definitely the 'County' Class 4-4-0s would not have appeared with the circular GWR totem. The correct tender lettering would have been 'Great Western' in full either with or without crest. To complete the model the Model Railway (Mfg) Company Limited, 14 York Way, Kings Cross, London N1, include 3821 *County of Bedford* in their Kings Cross range of engraved brass name and number plates. The price of this set is 8s 9d including tax but excluding postage. If you write away for a set, include a stamped and addressed envelope to cover postage and mention the AIRFIX magazine.

# DARING CONVERSIONS

by Ian Whitehead



THE 'Daring' class destroyers were designed as an enlarged 'Battle' class at the end of the second world war, to embody techniques and lessons previously learned, and two flotillas were ordered. The end of hostilities came before they were launched and one flotilla was then cancelled. The remaining eight boats were launched between 1949 and 1952, and are the largest destroyers ever built for the Royal Navy, displacing 2,800 tons. Indeed, due to their size, they were described as 'ships of the "Daring" Class' for a time, being neither destroyers nor cruisers. They have now reverted to the destroyer classification, and it is interesting to note that each of these ships cost as much as HMS *Warspite* when she was first completed. Due to the changing tactical concepts employed by the navies of the world today, they are probably the last true destroyers commissioned into the fleet, but their small ship tradition will be carried on by the frigate.

The names selected by the Ships Naming Committee for this class were those of the 1932 'D' class destroyers, which were decimated in World War 2 after adding many new honours to the roll of famous engagements and campaigns in which their predecessors took part. *Diamond* is the fifteenth naval vessel to carry the name, and her honours range from *Armada*, 1588, to *Greece*, 1941, where the fourteenth *Diamond* was sunk by aircraft during the evacuation.

The 'Daring' class is armed with six 4.5 inch guns, which are automatically controlled, in twin mountings, together with varying numbers of 40 mm AA guns. A Squid anti-submarine mortar is mounted on the quarter-deck and ten 21 inch torpedo tubes in two pentad mountings were originally installed. The torpedo armament has, however, been reduced in some ships and removed altogether in others.

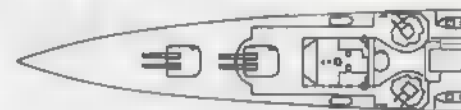
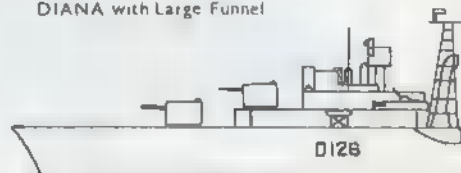
In spite of their size these ships are very manoeuvrable and are excellent sea boats. They proved their capacity for performing a large variety of duties, leading to the ordering of a further half flotilla for the RAN. Three were laid down in Australian yards and commissioned between 1957 and 1959, the fourth having been cancelled. The Australian units were named after the 'V' and 'W' class destroyers of 1918 which were transferred to the RAN, and formed the 'Scrap Iron Flotilla' which saw arduous service in the Mediterranean and other theatres of war. In February, 1964, HMAS *Voyager* (D04) and the carrier HMAS *Melbourne* were involved in a tragic collision and *Voyager* foundered with heavy loss of life. As a replacement HMS *Duchess* (D154) was loaned to the RAN where she still serves.

The Australian units were equipped with Limbo instead of the Squid carried by the RN vessels and only five torpedo tubes were fitted to bring them in line with the British boats.

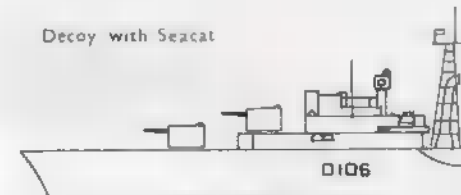
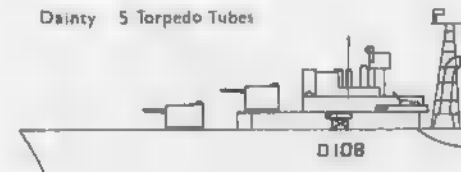
In 1959 the Admiralty decided to arm the class with Seacat AA missiles and the aft pentad torpedo tubes were removed and a deckhouse built over the tube space to provide extra mess accommodation. In *Decoy* (D105), *Diamond* (D35), *Diana* (D126) and *Duchess* (D154) this deckhouse was covered by a platform extending the full width of the ship and supported outboard by light stanchions. The aft twin 40 mm guns were removed and the ones in the bridge wings reduced to singles. In 1963, the decision on Seacat was reversed and only *Decoy* ever received the missiles, which were landed in 1964.

Recently, *Dainty* (D108), *Daring* (D05), *Defender* (D114) and *Delight* (D119) have had their forward torpedo tubes removed and the space plated in to form a deckhouse. During this refit, the bridge was also modified and a new type of radar director fitted.

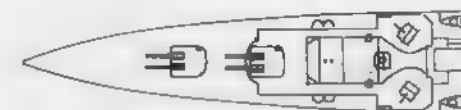
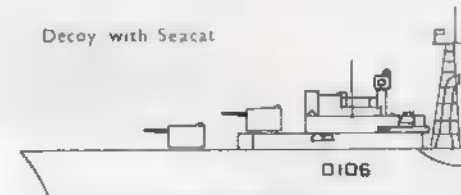
DIANA with Large Funnel



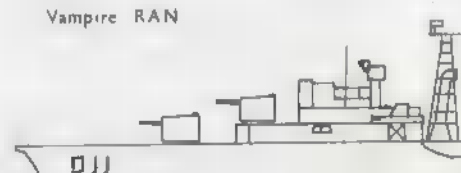
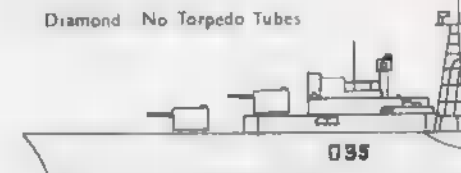
Dainty 5 Torpedo Tubes



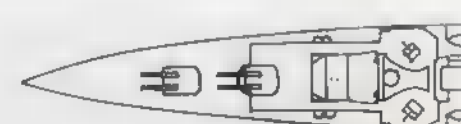
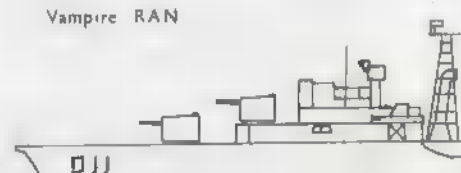
Decoy with Seacat



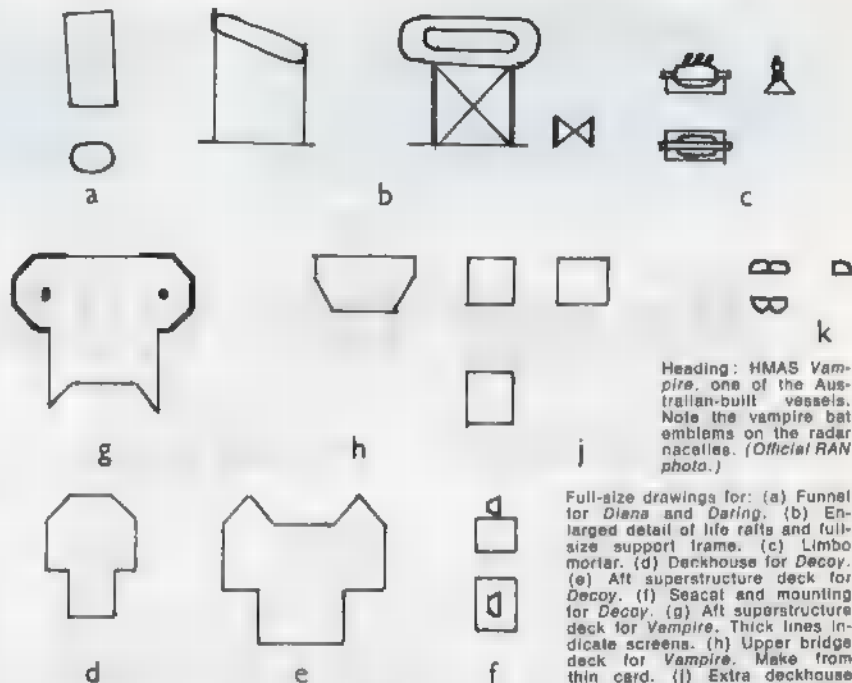
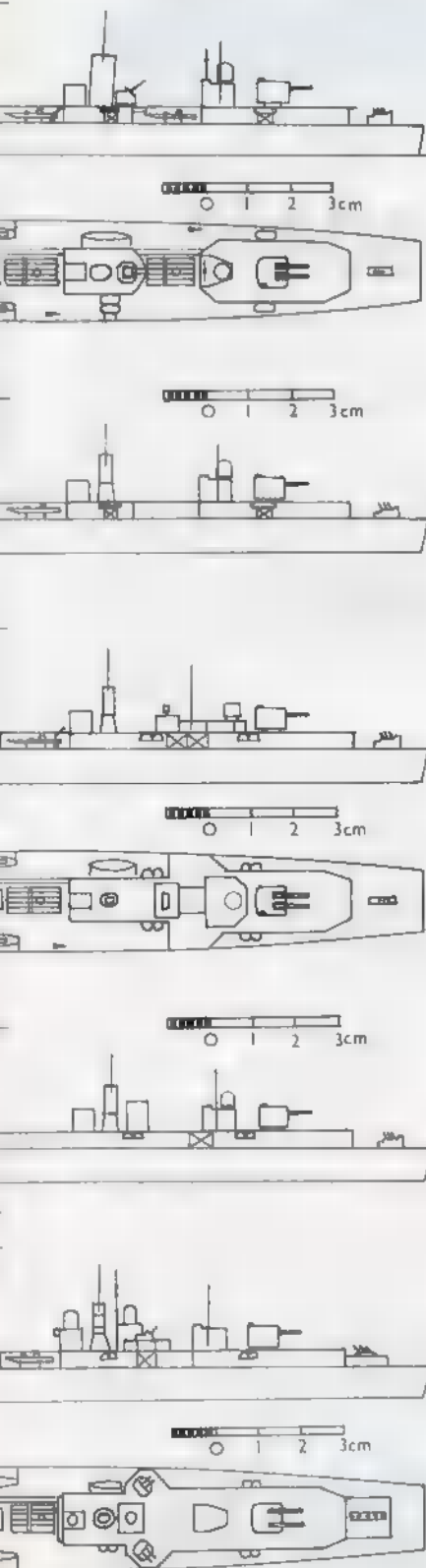
Diamond No Torpedo Tubes



Vampire RAN







Heading: HMAS Vampire, one of the Australian-built vessels. Note the vampire bat emblems on the radar nacelles. (Official RAN photo.)

Full-size drawings for: (a) Funnel for *Diana* and *Daring*. (b) Enlarged detail of life rafts and full-size support frame. (c) Limbo mortar. (d) Deckhouse for *Decoy*. (e) Aft superstructure deck for *Decoy*. (f) Seacat and mounting for *Decoy*. (g) Aft superstructure deck for *Vampire*. Thick lines indicate screens. (h) Upper bridge deck for *Vampire*. Make from thin card. (i) Extra deckhouse for *Vampire*, *Duchess*, etc. Aft of second funnel. (k) New pattern life rafts.

*Duchess* was fitted as leader and carried four 3 pdr saluting guns on 'X' gun deck together with a small deckhouse aft of the second funnel. This deckhouse is now in each ship of this group. In an early attempt: to improve the appearance of these ships, the second funnel in *Daring* and *Diana* was enclosed in a raked casing, but this was removed in 1957. There are thus eleven *Daring* class ships to model and variations of several of them. None of the conversions is difficult and they make ideal subjects for newcomers to this side of the hobby.

The first one involves the alteration of the after funnel to produce *Daring* or *Diana* up to 1957. The funnel is made to the pattern given, from balsa or large sprue section. If wood is used, it should be given a coat of sanding sealer and rubbed down with flour paper before painting. In this connection, it is difficult to match a paint mix to the grey plastic, and a better job is produced by painting the whole model. A certain amount of fine detail can be added to enhance the model and catwalks fitted between the islands come into this category. They are made from card 1½ mm wide x 18 mm long and fitted to the port side of the islands after first cutting away the guard screens in the appropriate place. I also removed the life rafts carefully from their present mouldings, chamfered the inboard edges slightly and reset these in the same place with the outboard edges supported by light frames made from stretched sprue. Reference to the

diagrams will clarify this point.

I also added whip aerials to the bridge, funnels and after superstructure and these were made from nylon toothbrush bristles cemented in place, as indicated in the drawings. The bridge and aft superstructure mountings for these aerials are moulded into the model and I drilled into these with a No 76 drill to hold the bristles more firmly.

To model the 1959 version, it is necessary to omit the aft torpedo tubes, and continue the island aft to 'X' gun deck by adding card bulkheads 18 mm long x 3 mm high. This should now be covered in to complete the deckhouse and the model completed as previously outlined.

The AA armament may be retained or reduced to single guns mounted in the bridge wings. If the latter arrangement is adopted, the deckhouse roof should be extended for the full width of the ship to the drawing given. *Diamond*, *Diana*, *Decoy* and *Duchess* were modified to this design as preparation for the installation of Seacat missiles. Supporting frames at the ship's side are made from stretched sprue following the plans, and these are inserted at the points where the platform is at the ship's full width. To model *Decoy* with the missiles, the Seacat launcher is added, with its screen on top of the mounting structure which was carried by all four of this group. The mounting is made from ¼ inch balsa to the given pat-

Continued on page 103



The recently introduced Airfix 'Elite' series cars make ideal motorisation subjects for 1:24 scale club or home circuits. The Pontiac GTO (left) and Dodge Charger are dealt with in this article, using the MRRC chassis.

# Power for 1:24 scale

**By Geoff Snell**

WITH the growing popularity of 1:24 scale racing it is likely that readers of AIRFIX magazine who have hitherto stuck to 1:32 scale, might like to try the larger size. The recent announcement of the Airfix Dodge Charger and Pontiac GTO static kits coupled with that of the MRRC 1:24 scale motor and chassis gives an ideal opportunity for an introduction to this larger scale.

The cars shown in this article are similar in configuration but have two main differences; the chassis of the Charger is extended and different types of body mounting are used. In order to keep things simple, the construction of the Charger will be described first and any differences for the GTO noted later.

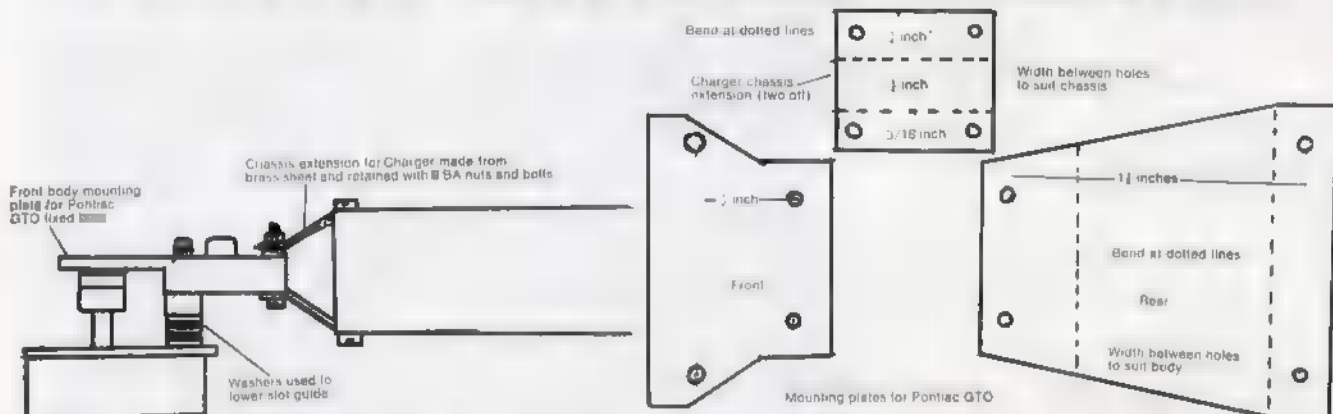
MRRC steel gears are used, 3.5:1 in the example shown, and the first step is to remove the brass collar from the 3/32 inch end of the motor shaft, carefully keeping the washer behind this collar in place to avoid losing the ball-bearings, and putting

the pinion on in its place where it can be retained with solder or an epoxy resin such as Britfix '88'. Next, take two chassis side pieces and put them on the pinion end of the motor and screw them and the body mounts to the motor using the self-tapping screws supplied in the kit. Now put the axle through the bearing cups in the side pieces and the 1/8 inch hole in the contrate gear and adjust the side pieces so that the gears are roughly in mesh. Fit the two front side pieces and retain them and the front of the body mounts with two more self-tapping screws.

The ball-bearings for the rear axle can now be assembled. Centre the axle, move the contrate close to the pinion, and fit a collar to the opposite side to hold the axle in position. Smear grease around the opposite

bearing cup, place nine balls around the axle in the cup, and fasten the collar to retain them. Now, holding the axle in position, move the contrate hard against the chassis side piece and fit the balls on the opposite side. The contrate can now be moved into mesh with the pinion and side pieces, and collars and contrate adjusted until a good mesh is obtained.

The chassis of the Charger has to be extended in order to get the correct wheelbase and two pieces of brass sheet are cut out and drilled as in the diagram, fitted and retained with 8 BA screws and nuts. It is advisable to fit the front wheels, MRRC 1:24 scale dural in this case, to the stub axles before these are fitted to the front axle, as the wheel retaining pins may need to be hammered into position. Once the wheels are fixed the stub axles should be fitted to the axle beam with the track rod ends facing forwards and upwards, the track rod being fitted at the same time.



Below, left: Underside of the completed Pontiac GTO motorisation showing the body mounting plates added to the basic chassis. Below, right: Underside of the Charger shows the extended chassis. MRRC wheels and tyres are used.

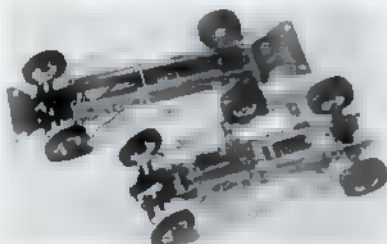




Fit four inches of flex and the braids to the guide (this was described in the September issue of AIRFIX magazine) and fit the guide in position, using four or five 10 BA washers as spacers to allow for the large wheels, and retain it with the cap provided.

The wheelbase can now be checked against that of the static chassis, all the screws tightened, the leads soldered to the motor brushes, rear wheels (MRR 700 x 15 Air) fitted, and the chassis is ready for testing.

Body assembly is confined to the bonnet, which is glued in position, the windows, the bare interior and the chassis. When the cement has set, enough of the chassis and interior is cut away to allow the motorised chassis to fit in, a Weller soldering



Comparison of the Pontiac chassis (top) and Charger chassis showing different methods of mounting attachments.

gun with a cutting tip being ideal for this; care should be taken to ensure that the wheels do not foul the interior. The body mounts should now be bent until the body has a realistic 'sit' on the chassis and the

ends trimmed flush with the side of the body which can then be retained with self-tapping screws. Any exterior detail required can now be added and the car is ready to race.

Assembly of the GTO is similar but, in this case, the body mounts are omitted and the steering unit is fitted directly on to the chassis side pieces. Body mounts are made up to the dimensions shown in the diagram and fixed to the chassis with 8 BA screws and nuts, and to the body with the bumper retaining screws. No interior is used.

Although these cars, motorised as described, are meant, primarily, for use on club tracks and commercial raceways, it is possible to use them on Airfix track whereupon things can get rather exciting.

### 'Daring' Conversions — from page 101

tern, and the launcher was taken from a *Devonshire* kit, but a good replica can be produced from a quadruple pom-pom as in *Cossack*, or alternatively, from scrap. The bridge also requires some modification to reproduce its contemporary state. First, all the thick circular vertical projections are removed, and then an upper deck of 10 thou card is added, supported on stretched sprue, in line with the diagrams. The old type radar is not fitted, and to represent the present pattern, I fitted a surplus *Tiger* director to the support in the kit, having first removed the director.

This layout is similar to the RAN ships which also mount only five torpedo tubes. The roofing-in of the aft tube space is, however, different, since the twin AA guns are mounted either side of this deck, and singles in the bridge wings. They also retain the old type radar for the time being. The Squid should be replaced by Limbo and card screens extending aft from the shelter deck installed round this weapon. It is proposed to equip these units with Ikara missiles in the near future, and this will necessitate removing 'X' turret of twin 4.5 inch guns.

If a contemporary model of *Dainty*, *Daring*, *Defender* or *Delight* is wanted, the forward torpedo tubes should also be omitted, and the space 'plated in' as previously described. The bridge and director should also be modified as for the last conversion.

For all these later models, say 1959 to date, the old pattern of life rafts supplied with the kit should be removed, and the newer pattern fitted, November, 1967

I had a supply of these remaining from a *Tiger* conversion, but they can be modelled from scrap. They are positioned in accordance with the illustrations. The models can now be finished in light Admiralty grey.

The RN pennant numbers are of the usual style, as supplied with the kit, and I used the 1 inch black 'Yeoman' sheets of transfers to mark my models.

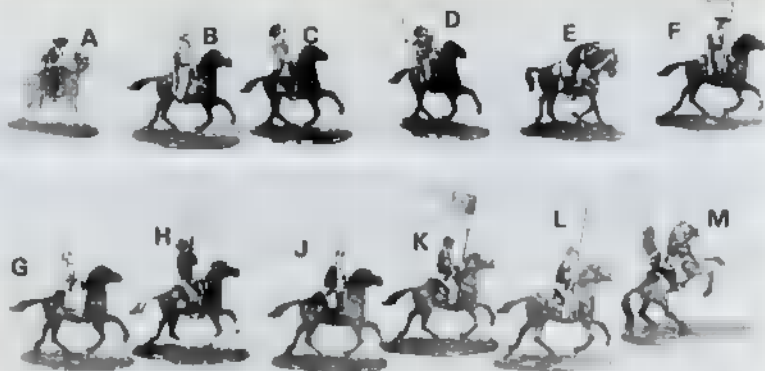
The RAN has recently changed its

style and the numbers are carried immediately aft of the anchors just below the deck level. The strokes are finer than before, being executed in white with black blocking in a similar manner to the US Navy. Black lettering with careful lining out can produce quite a realistic effect, or alternatively, white Yeoman lettering with the black blocking added with a fine pen before fixing is effective. Black paint thinned down for pen use is recommended.

*Vampire* (D11), *Vendetta* (D08) and *Duchess* can be treated thus. If the modeller does not wish to tackle this, the old style and position of numbers will represent the ships at an earlier date.

Below, top to bottom: Models of HMS Diana, HMS Decoy, with Sea-cat missile launcher, and HMAS Vampire, show the considerable differences in appearance between ships of this class.





*Cavalry for the US Civil War can easily be provided from various mounted figures in the Airfix range. All are converted as described in the text. Key: A—8th Texas Cavalry. B—Confederate regular trooper. C—Officer, 1st Virginia Cavalry. D—Trooper, 1st Virginia. E—Trooper, Charleston Light Dragoons. F—Confederate standard bearer. G—Union regular trooper in cape. H—8th Texas Cavalryman in captured Union clothing. J—Union trumpeter. K—Union standard bearer. L—Union guidon bearer. M—Union officer.*

# US CIVIL WAR

Michael Blake models the cavalry

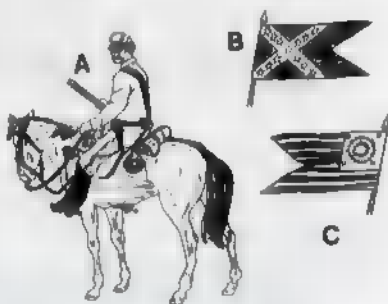
**C**IVIL WAR cavalry uniforms, especially in the South were often very dandified. To prepare Airfix 7th Cavalry for service, some standard alterations are necessary. The rolled sleeves must be trimmed down, canteens removed, and the open neck shirt collar cut away. The shoulder belt should be smoothed in front and a 2 mm square ammunition pouch made from sprue, stuck on beneath the buckle at back. The troopers are now ready for painting as Regulars.

## Confederates

Regulation issue was similar to the infantry's. A short 'shell' jacket of grey with high collar, and light blue trousers worn inside or outside the boots. For the latter, trim the boot tops level with the leg. Kepi was yellow, with a black peak and dark blue band around the bottom. Jacket had yellow collar, cuffs, and trim down the front and around the bottom. Trousers had a yellow stripe. NCO's chevrons were yellow. A slouch hat often replaced the kepi as the war progressed, and was usually dark grey or black. For this, swap heads with Confederate Infantry. Equipment consisted of revolver, carbine and sabre. Revolver holsters made from scrap plastic are stuck on the right hip. The carbine, made from rifles from converted cowboys or crawling Airfix Union Infantry by

trimming them to 14 mm, was carried slung from the shoulder belt, with the barrel down behind the right leg. The sabre was often carried on the horse. For this, cut the scabbard from the figure and replace it under the saddle on the saddle cloth on the left side, handle forward (see drawing). The scabbard was steel with gilt fittings. Field Officers wore a slouch hat often with plume, or kepi, and red waist sash. The scabbard was black leather. Many favoured buff corduroy breeches or their pre-war Union blue trousers. Collar badges and gold braid on sleeve denoted rank.

The most famous of all Rebel Cavalry was Jeb Stuart's 1st Virginia



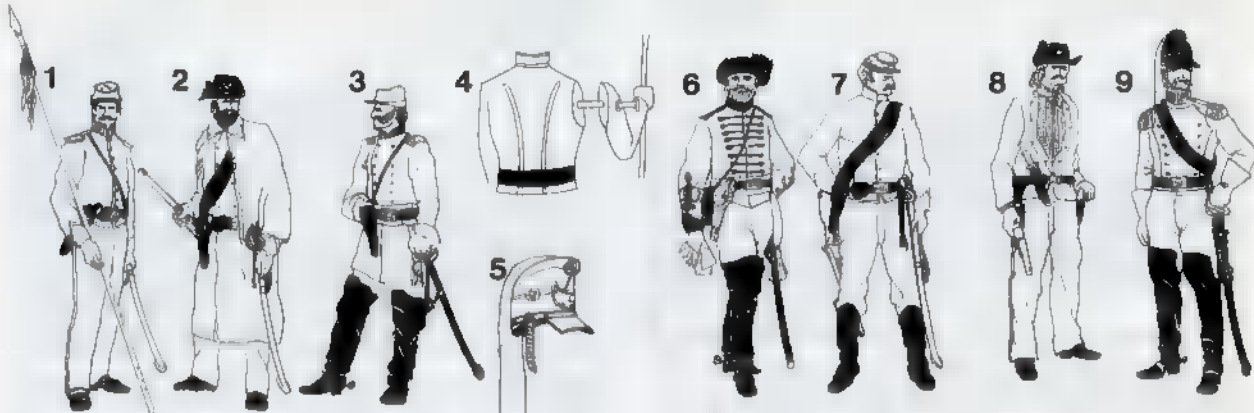
*Detail drawings show (A) Confederate trooper with sabre on saddle cloth, canteen, and blanket rolls, (B) the Southern battle flag, and (C) the Northern (Union) standard. Colours given in text.*

Cavalry. They wore grey jacket and trousers with black slouch hat. Again swap heads with Airfix Confederate Infantry, adding a yellow cord around the base of the crown. Jacket had black collar, cuffs and shoulder straps and frogging across front. They were known also as the Black Horse Cavalry from their mounts. Officers wore a black plume on their hats, which is made from paper or Barbola, the usual 'chicken-guts' on the sleeve and a yellow sash.

The 8th Texas Cavalry (Terry's Texas Rangers) looked like Western Cowboys, wearing civilian clothes and Confederate or captured Union items where possible. They embellished their equipment and clothing with the silver Texan 'Lone Star' and favoured the slouch hat. The mounted Airfix Cowboys suit admirably, and 7th Cavalry figures can also be painted suitably. The sabre was rarely carried, however, and must be removed and replaced by a revolver made from a 4 mm length of bent pin built up with UHU. The Rangers carried a knife and two revolvers on their belts, and often two more on the saddle (all from scrap plastic). Double barrelled shotguns originally carried were later replaced by carbines and rifles. The hat should be black with a silver star at front. Scarf was pink or red and shirt usually white, pink or checkered; jacket was dark blue, brown or grey with red collar and cuffs. Trousers were blue, brown or grey with a red stripe down outside seam. The belt had a silver star buckle and stars decorated each holster, which is made from scrap plastic.

Company K, 4th South Carolina Cavalry (Charleston Light Dragoons) had a very fancy full dress uniform. This was replaced in action by regulation uniform but does make a fine show. Using the 7th Cavalry, remove the scabbard, shoulder belt, and boot tops (which should be re-cut above the knee) as well as the canteen, etc. Replace the head with one from the 1914 German Infantry with spike removed. Cut a slot in the top to take a shaped ridge (see drawing) and a second slot for the peak. Peak is about 3 mm deep by 4 mm wide, and the ridge measurement can be gauged from the drawing. Make a plume from unravelled white cotton and stick on a helmet crest. Painting is a little easier. The helmet is black with gold trim, the short coat dark blue with a red plastron with a double row of six brass buttons. Trousers and gauntlets were white. A new shoulder





Uniform and modelling details for Civil War cavalry conversions. Key: 1—Trooper, Rush's Lancers. 2—Sergeant, Union regular. 3—Officer, Union regular. 4—Method of making movable lance arm; note also the seam strips on back. 5—Charleston Light Dragoon helmet. 6—Officer, 1st Virginia Cavalry. 7—Trooper, Confederate regular. 8—8th Texas Cavalry. 9—Charleston Light Dragoon. All colours given in text.

belt from 1 mm wide paper now goes over the right shoulder and is black. Gold epaulettes are represented by painting and buckles and spurs are gilt. The sabre scabbard is now replaced, hanging away from the body, painted black with gilt fittings.

### Federals

Regulation dress was dark blue short coat with high collar and kepi and sky blue trousers. Jacket was piped down the front, round the bottom, and round the cuff, all round the collar and down the back seams in yellow. NCO's chevrons were yellow. Brass shoulder scales were worn and can be represented by painting. Trousers had a yellow stripe. The kepi had crossed sabres on the crown, the black slouch hat—also worn—had them at the front. The long sky-blue overcoat with cape can be represented using Arab horsemen. Cut the long flowing robes to size, change heads with the Union Infantry and add sabres and/or carbines as necessary. Equipment was as for Confederates and officers had shoulder bars.

The one Lancer regiment in the war was 6th Pennsylvania (Rush's Lancers). They wore regulation uniforms, without shoulder belts, and carried 9 feet lances of Norway fir with 11 inch steel tips. Make this with a 40 mm length of wire with a scarlet swallow-tailed pennant 4.5 mm. from tip. Either adjust the arm of the 7th Cavalry figure to hold the levelled lance, or stick the lance upright behind the right arm butt by the foot, or attempt a more complex conversion combining the two. Remove the sabre from the hand, cut the arm from the body (see drawing) and push half a pin through the arm at shoulder level and into the body, countersinking the pinhead slightly. Push the lance through the hand, and

the arm will now rotate to either a 'carrying-ready' or charge pose. You may have to practice on a few figures to get this just right. The Lancers' rear blanket roll was unusually large, so remove the existing one and replace with a roll of Barbola as wide as a horse and 3 mm in diameter.

All troopers, Rebel and Yankee, had a second smaller roll in front of the saddle. Make this from Barbola. The canteens from the figures should now be replaced on the saddle cloth. Cloths varied but were often dark grey or blue with red, black or yellow stripe.

### Standards, Guidons and Trumpeters

Confederates carried the 'Southern Cross' either 30 inches square (10 mm) or swallow-tailed and slightly longer. Texan units favoured the 'Bonnie Blue Flag', a single white star on a blue ground. The Federals' flag was slightly longer and always swallow-tailed, based on the 'Stars and Stripes'. The blue canton contained an outer circle of eighteen and an inner circle of twelve stars, and one star in each corner. Stripes were usually seven red and six white. Guidons were smaller, about the size of the Airfix flag, with the top half red, and bottom white. Trumpeters in the Union Cavalry had yellow trim on the jacket front in the same style as Infantry drummers described in the last article. Also in last month's article the captions to flag drawings 9 and 10 were transposed. Flag number 9 is the regimental colour and flag number 10 is the US national flag.

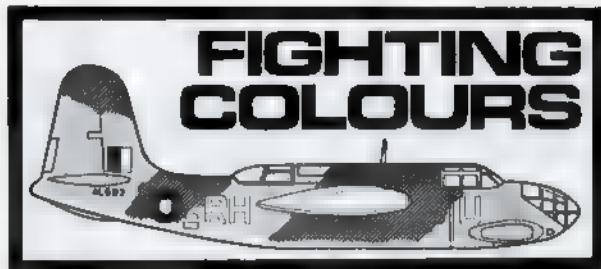
I also omitted to mention the need to trim 2 mm from the rifle barrel of Berdan's Sharpshooter figures to represent the Sharp's breech-loading rifle carried by this regiment.

### This month's

HH-N, a Typhoon 1B fighter-bomber, photographed in the summer of 1943 whilst being bombed-up. This very rare illustration from a colour slide gives quite good tone rendering, particularly where the greys are concerned. The grey has a distinctly blue tint that was associated with Typhoons but not Spitfires. Yet it still carried (on the dope tins!) the legend Dark Sea Grey. The spinner and tail band are quite good renderings of the wartime Sky. The dark green tone is best rendered beneath the roundel, but since this is correct one may muse as to why the other green areas are rather bright for the wartime colouring. The squadron letters are rather unusual in that they are not Sky but a shade of light grey—although in 1943 this was more prevalent than later and had been featured throughout the war until Sky was adopted to make the letters stand out better against a grey base when the colours on fighters changed from green/brown to green/grey. Unfortunately the airframe number is not known, but since the aircraft served with 175 Sqn, it is either EK133, '134 or '139.

The start of 1943 found No 175 Sqn at Gatwick. It moved to Odiham 14.1.43, to Stoney Cross 1.3.43, Lasham 11.3.43, and during the major exercise that had prompted these hasty moves, back to Odiham 12.3.43, to Stoney Cross 19.3.43, then to Colerne 8.4.43, Lasham 29.5.43, Appledram 2.6.43, Lydd 1.7.43, Newchurch 5.8.43, and was at Westhampnett from 9.10.43 until February, 1944.

M.J.F.B.



### Part 3: Summer, 1940

WHEN the German onslaught on Holland, Belgium, Luxembourg and France opened on May 10, 1940, British fighters at home and in France had dark green-dark earth/black and white finish. Squadron letters were grey, serials and spinners black. Thus adorned, Hurricanes in France at once engaged huge enemy forces. Nos 3, 79 and 504 Hurricane squadrons reinforced the Air Component's Nos 1, 85 and 87 Squadrons. No 501 flew to the AASF and was placed further south (behind the Maginot Line) and on May 11/12 fought terrific battles using Hurricanes including N2586.

The most serious situation on May 10 was that in Holland. Six Blenheim 1fs of No 600 Sqn attacked the airfield at Waalhaven. They ran into Bf 110s; only BQ-O returned. Undaunted, the squadron operated again soon after. Such was, as ever, the fighting spirit of the Royal Air Force. On May 12, 264 Sqn detached six Defiants to Horsham St Faith and, escorted by Spitfires of No 66 Sqn including N3027 and N 3043, Defiants L6964, L6970, L6972, L6973, L6975, and L7003 patrolled around the Hague and destroyed a Ju 88.

Hurricanes meanwhile were intercepting fighters and bombers over France. Soon they were defending their airfields, occasionally escorting Blenheims and protecting our troops. In the first week 22 Hurricanes of the Air Component were lost in battle including N2353 and N2360 of 87 Sqn. Fifteen were seriously damaged on the ground. They had claimed 70 enemy aircraft. By May 17 there were only sufficient Hurricanes to equal about three squadrons. On May 21 the remnants of the Air Component headed for Britain to fly cover patrols from there.

Two Gladiator squadrons were at Vitry when the storm broke. No 607 Sqn went into action early on May 10 claiming seven enemy aircraft and fought until their base was heavily raided. On May 21 their remnant left Boulogne without any aircraft. For 615 Sqn the tale was almost the same. After retreat to Britain a detachment continued the fight until May 30, covering the beaches of the Pas de Calais.

Hurricanes of the AASF fought on, retreating to any suitable strips, and by June 3 were south-west of Paris. By June 15 nearly all Hurricanes were lost, those remaining being ordered north to cover the evacuation from the Channel ports. Now 17 and 242 Sqn Hurricanes (eg, N2651 and N2345 of 242 Sqn) flew to France, Nos 1, 73 and 242 being deployed to defend the ports of Brest, Nantes and St Nazaire. Eventually Nos 17 (whose machines included P2557, P2558 and P2559) and 501 Squadrons fell back to Dinard, then the Channel Islands to defend St Malo and Cherbourg. On June 18 the AASF Hurricanes were ordered home. Of 261 Hurricanes which had served the Air Component 75 were destroyed by enemy action, 120 by other causes. Only 66 made the journey to Britain. Another 44 of the AASF were lost.



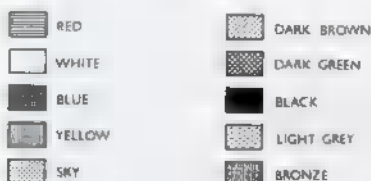
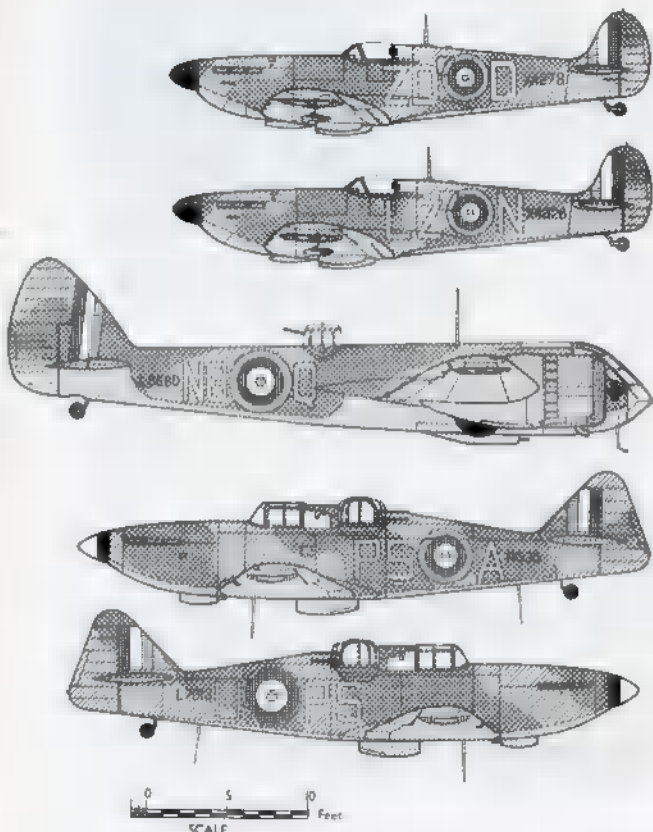
**Top:** Two Spitfire 1s of 609 Sqn taxi out at a Scottish airfield on April 8, 1940. Both have black/white/silver undersides and grey codes ('Flight: International' photo). **Above:** Well-known but interesting view of 610 Sqn Spitfire 1s in 1940. Research suggests that DW-K is N3289 which was shot down on May 29. Underside of fuselage is black but rest of underside appears to be a shade of Sky. Neither machines have underwing roundels. DW-O has larger roundel and possibly all-Sky undersides. Evidence suggests that picture dates from defence of the French ports (Imperial War Museum).

### DEFENDING THE BEACHES

Spitfires had mainly been held in reserve for home defence. However, they were alerted for defensive patrols on May 10, and made some offensive patrols. The temptation to send them to France was resisted, although four from 92 Sqn escorted Churchill's Flamingo to Paris on May 16. Blenheim fighters, easy prey by day, now stood by for night patrols, although as yet there was no special allocation of squadrons specifically for this purpose. Thus it was that Spitfires of 19 Sqn were scrambled on the night of June 18/19 to investigate a raid on Mildenhall. L1032 caught up with an He 111 and engaged it near Bury—just as searchlights lit the fighter! The bomber fired back and soon the Spitfire was afire. The bomber was, however, doomed. It fell in flames near Fulbourn village. At the same time K9807 was chasing a Heinkel which it destroyed near Southend. But only if the searchlights were effective could the Spitfires expect success. As yet A.I radar was not a standard fitting in the Blenheims, seven of which from 23 Squadron had scrambled like the Spitfires. YP-X shot down a Heinkel near Newmarket before crashing itself, and YP-S was shot down by a German bomber. It was an expensive night, and memorable for the writer as the bombs from another Heinkel whistled overhead in the most serious attack yet on any British town.

Yet the fight over Britain had not yet really begun. It was the battle to defend the evacuation of the BEF that Fighter Command was now savagely waging. The first major dog-fight involving Spitfires came on May 23 when 74 Sqn engaged Bf 109s. Soon 54 and 92 were busy, and the Spitfires were now embroiled. The decision to withdraw from Dunkirk really brought the home-based fighters into action and, often unseen by the troops below, they unceas-





Drawings  
by A. M. Alderson

Drawings show, from top: Spitfire I X4278 of 222 Sqn which had a very short career. Delivered on August 31, 1940, it was shot down on Sept 4. Spitfire I X4326 of 66 Sqn, Sept 5-Oct 12, 1940. It later served briefly with 61 OTU, 8 OTU, and 24 Comms Sqn. L8680 of 604 Sqn in late July, 1940, with belly gun-pack in place and roundels under wings. Yellow surround to roundel has been painted on to the late-1939 style roundel. Defiant N1535 in factory finish but with undersides re-sprayed Sky (duck egg green shade). Used by 264 Sqn from June 14, 1940, it was lost in action on August 24. Note Sqn Ldr's marking under cockpit. L7013, which was delivered with red/white/blue fuselage roundels and black/white undersides. By August 1940, when depicted, non-standard yellow surround was added to fuselage roundel and undersides had been re-sprayed Sky. Note also non-standard 'U'.

ingly patrolled the beaches and areas surrounding, heading off hordes of German aircraft. At night the Blenheims of 604 Sqn played their part. As soon as the BEF was home a sort of respite in the fighting came, before the greatest battle in Britain's history was forced upon her.

Many squadrons were engaged in the tough action over the Channel ports, and aircraft known to have been involved include Hurricanes P2557 (17 Sqn), N2655 (32 Sqn), N2584 (43 Sqn), P2721 (213 Sqn), P2876 (229 Sqn), N2559 (245 Sqn) and P3393 (601 Sqn). Spitfires involved included

November, 1967

N3237 (19 Sqn), N3272 (64 Sqn), N3232 (222 Sqn) and N3289 (610 Sqn). Regrettably their 'individual letters' seem never to have been noted . . . there were problems, even for the handful of unauthorised spotters!

## CHANGING OF THE COLOURS

In Autumn, 1939, some Blenheim day-bombers had their under surfaces sprayed light grey-blue. This was a more suitable hue than the matt black with which they began their war. Black/white fighter finish was satisfactory for a fighter expected to do battle in cloudy conditions by day and night, but fighting would now clearly be in blue skies—and between milling hords. Better, surer, means of identity were also required.

From evidence available it seems likely that Fairey Battles of the AASF were first to have broad red-white-blue fin striping, applied before the May campaign. Some certainly had a yellow surround added to fuselage roundels too, ensuring Allied fighters could (and would) recognise them. Fin striping was an additional aid, particularly for the French whose aircraft carried rudder stripes in paler-tones. Quickly the addition of a yellow surround to fuselage roundels spread in May and June, 1940, and to all RAF aircraft. Both fin stripes and yellow surrounds varied enormously, and from aircraft to aircraft on the squadrons, but not in basic positioning, etc. An outer ring was frequently added to the under-wing roundel on the black wing, in yellow or in white or grey—depending upon dove availability. It seems doubtful whether many of the Hurricanes in France survived long enough to have the additions, but home-based fighters quickly adopted them for the fight over the beaches of France.

By the end of May home-based fighters were beginning to wear new under surface colours. At first under surfaces were silver, a colour evident on some Spitfires—at least in June, 1940. In July this was superseded by pale 'blue' shades which, on some the Hurricanes I saw at Debden and Duxford, were almost as dark as the azure blue of later years. For the most part this Sky tint meant to be blue was more accurately a pale shade of green sometimes having in/oned a blue tint commonly and fairly accurately called duck egg green. Most fighters eventually settled for this, and by the end of August it was the most common shade. In later years the officially designated Sky Type 'S' was a much lighter tone than that of 1940.

The confusion of those hectic days was bound to bring anomalies. Before the battle-damaged fighters went in for repair some were in use that summer with black/white, black/Sky, or black/white/silver under surfaces. It is difficult to generalise about any aircraft markings, but squadron letters were usually applied ahead of the roundel on the fuselage port side, aft on the starboard. Letter size varied considerably, some fighters having two sizes of codes, others opting for huge lettering. Of the many aircraft I saw in 1940 none had other than mid-grey to rather darker grey letters. Spinners remained black. Hurricanes appeared to have 'standard sized' under-wing roundels, but many Spitfires—especially in the later stages of the Battle of Britain—had very large underwing roundels.

Continued on next page

Below: Late Battle of Britain finish is typified by these 85 Sqn Hurricanes, VY-U(V6611), VY-Q(P3854) and VY-M(7240).



## Fighting Colours — continued

It was the end of July, 1940, when I first recorded a 264 Sqn Defiant with duck egg green under surfaces. Others adopted these soon after and still had them at the start of their night-fighting attempts. Like the Blenheims, the Defiants did not usually have underwing roundels it would seem. The twin-engined fighters were painted similarly to others, and this extended to the Blenheim fighters of Coastal Command.

With the return of winter under surfaces of the port wing were again painted matt black, the roundel officially having a yellow outline usually half the width of the other rings. The fighters had then come into line with the few Whirlwinds in service in the summer which retained these colours as a special identity feature.

## FIGHTERS FOR THE FEW

It would be pleasing to describe markings of aircraft flown by well known Battle of Britain pilots, for over the years the idea has grown that each had a particular mount. In reality this was rarely the case. Occasionally a pilot did keep the same machine for a short period, but battle damage, unserviceability, modification programmes, major overhauls, etc, meant that one aeroplane could be available for only a short period. All that can really be said is that such-and-such an aeroplane was a mount on certain occasions. 'Sailor' Maize flew with No 74 Sqn where aircraft he used included K9953, R6773, R6757 (June 31, 1940) and P9306 (July 13). Sqn Ldr Douglas Bader flew Hurricane P3061 on September 7 (his usual mount of the period) but on September 15 he was using V7467 also of 242 Sqn.

During May, 1940, the first production Spitfire II flew. It differed from the Mk I in having a Merlin XII, Coffman cartridge starter, and curved canopy as a standard fitting along with other less obvious small modifications. P7280, the first Mk II, was delivered to Boscombe on June 27. No 152 Sqn received P7286 on July 17, but it was 611 Sqn which was the first to fully equip with and operate the new version. Delivery was largely made in the third week of August, aircraft involved including P7291, '92, and 7300. No 266 Sqn received Mk IIs (eg P7296, '97) in the first week of September, then 74 Sqn had them by mid-September (eg, P7306). No 19 Sqn next equipped, then 603 Sqn. Production of the new version at Castle Bromwich gathered tremendous momentum. About 150 Mk IIs were delivered by the end of October.

## THE FINEST HOUR

On May 22 No 32 Sqn mixed with Bf 109s and N2406, N2459, N2461, N2527, N2582, P2755 were each credited with an enemy fighter. P3671 of 111 Sqn rammed a Do 215 on July 10, the first day of the Battle. August 11 was one of the most hectic days—R6614 was a Spitfire then used by 152 Sqn, R6630 by 610 Sqn. Aircraft used on August 15 included P3047 (1 Sqn), R4193 (111 Sqn), L6985 (264 Sqn), R6988 (234 Sqn), R7015 (54 Sqn). Amongst the aircraft flown into battle on September 15 were P2725 (504 Sqn) which rammed a Do 17 over Victoria Station, R6699 (609 Sqn) which shot down a Do 125 near Portsmouth, R4089: NN-R of 310 Sqn, X4179 of 19 Sqn which claimed two Bf 109s and X4351 also of 19 Sqn which destroyed a Do 17. Others used on this day included P9324 (41 Sqn), R7019 (603 Sqn), V6888 (607 Sqn) and P2760 (501 Sqn).



**Above:** Defiants in Summer, 1940, displaying the 'A' and 'B' schemes. PS-A and T have the 'B' scheme and the remainder the 'A' scheme. PS-A is drawn on previous page (Imperial War Museum).

Hurricanes with duck egg under surfaces seen at Croydon in June, 1940, included V7128:DT-D, V7167:DT-H. A silver undersided Spitfire in use at this time was N3267:XT-S. Blenheim L8068:NG-E was then in use (Sky under side) without underwing roundels. Croydon's residents in July included YO-L:313 and YO-N:319 of No 1 RCAF Sqn. TM-V:P3774 and VK-A:P2946 were then wearing standard sized and proportioned roundels. PR-D:R6769 in use in August still did not have a yellow surround to its fuselage roundels, and L1059:OU-B still had silver under surfaces. P3055:US-P with large code letters was in use in September, and had Sky under surfaces.

At the end of the Battle of Britain the Italian Air Force made a brief appearance over Britain. Amongst the intercepting fighters were Hurricanes V6680 and V7607 of No 257 Sqn.

## Fighters available for the summer battles

Hurricanes available for action were drawn from the following batches delivered to the end of October, 1940, approximately: L1547-2146 (delivered 12.37-8.10.39); N2318-2367, N2380-2409, N2422-2441, N2453-2502, N2520-2559, N2582-2631, N2645-2674, N2700-2729 (delivered 29.9.39-1.5.40); P2535-2584, P2614-2653, P2672-2701, P2713-2732, P2751-2770, P2792-2836, P2854-2888, P2900-2924, P2946-2995, P3020-3069, P3080-3124, P3140-3179, P3200-3234, P3250-3264 (delivered 10.39 to 7.40); P3285-3279, P3300-3324, P3345-3364, P3380-3399, P3400-3419, P3420-3429, P3448-3487, P3486-3492, P3515-3554, P3574-3578, P3579-3623, P3640-3684, P3700-3739, P3755-3789, P3802-3836, P3854-3903, P3920-3944, P3960-3984 (delivered 21.2.40-20.7.40); R4074-4123, R4171-4200, R4213-4232, R2680-2688, T9519-9538, W8687-6670, V7200-7209, V7221-7260, V7276-7318, V7337-7386, V7400-7448, V7461-7510 (delivered 2.7.40 to 10.40). Deliveries of the batches V8533-6582, V8600-6648, V8665-6704, V8722-6761, V8776-6825, V8840-8888, V8913-6862, V8979-7028, V7042-7081, V7089-7138 and V7156-7185 had also been made.

Spitfires delivered by the end of October, 1940, were Mk I: K9787-L1098 (delivered 27.7.38-9.39); N3023-3072, N3091-3130, N3160-3203, N3221-3250, N3264-3299 (delivered 9.39-1.40); P8305-8338, P8360-8399, P9420-8489, P9490-9519, P9540-9584 (delivered 20.1.40-4.40); R6595-6644, R6683-6722, R6751-6780, R6789-6818, R6829-6840, R6879-6928, R6957-6988, R7015-7023 (delivered April-July, 1940); X4009-4038, X4051-4070, X4101-4110, X4159-4188, X4231-4280, X4317-4368, X4381- (delivered from 19.8.40 to October, 1940). From these aircraft it must be remembered that there were various conversions to other marks, and for PR purposes. Spitfire Mk II delivered by 10.40 were approximately P7280-7329, P7350-7389, P7420-7449, P7490-7509. Defiants delivered by October, 1940 were L6950-7036, N1535-1582, N1810-1853, N1871-1706, N1725-1773, N1788-1812.

## The Squadrons and their aircraft

Principal fighter squadrons engaged in the summer of 1940 and examples of aircraft used during the fighting follow. All too often it will be seen that whereas unit identification letters are known (although Hurricanes were seen in squadron use coded JB and ML which remain as unidentified unit letters; and confusion occurs over the use of HE and HP, perhaps duplicated at some period, only the serial number of an aircraft actually used can be set alongside without its individual letter. Additional information to fill these gaps would therefore be welcome.

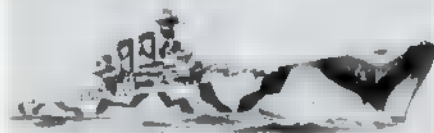
*Continued on page 110*

AIRFIX magazine



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BL 2 T92 Destroyer Tank	1/55	9/11	BL15 M8 Armoured Car
BL 3 Crusader Tank	1/55	9/11	BL16 AMX30 French T.
BL 4 T235 Long Tom	1/55	9/11	BL17 AMX DCA French
BL 5 SU57 Stalin Tank	1/55	9/11	Tank
BL 6 M24 Chaffee Tank	1/55	9/11	BL18 SU100 Assault
BL 7 JS111 Stalin Tank	1/35	37/11	Gun
BL 8 T-55 Tank	1/35	25/11	BL19 M48 Patton Tank
BL 9 T-34 Tank	1/35	19/11	BL20 M4 Sherman Tank
BL10 M41 Walker Bulldog	1/35	19/11	BL21 M4 Sherman Tank
BL11 Chieftain Tank	1/35	37/11	BL22 M4 Sherman T."
BL12 Scorpion A. Car	1/35	12/11	BL23 PzKw3*
BL13 Coventry II A. Car	1/35	12/11	BL24 PzKw3*
			BL25 Big Shot*
			BL26 Panther Tank*
			BL33 AMX105 French T.
			BL50 Rommel Tank
			BL53 75mm Assault Gun
			BL54 M-2 155mm Gun
			Nihon Hobby
			BL27 M24 Chaffee Tank
			BL28 JS111 Stalin Tank
			BL29 Type 61 Jap Tank
			Note: BL54 not motorised.
			* Remote Control with 2 Motors.

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GL10 Battleship Musashi 1/250. Two Electric Motors	199/6	
GL 9 Battleship Yamato 1/250. Two Electric Motors	199/6	

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RL 3 C. Helldiver	1/78	4/11
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RL 6 Shion (Norm)	1/72	4/11
RL 8 Ki-100	1/72	4/11
RL 9 A6M2 Zero	1/72	4/11
RL10 Dauntless	1/72	4/11
RL11 M6A1 Seiran	1/72	4/11
RL13 A7M Reppu (Sam)	1/72	4/11
<b>L.S.</b>		
RL14 Ki-109	1/72	24/11
RL15 Ki-67 Torp. Bomb.	1/72	24/11
RL16 Peggy H.B.	1/72	24/11
RL17 Judy Bomber	1/75	4/11
RL21 A6M2 Rufe	1/75	4/11
RL23 G3M3 Nell	1/72	19/11
RL45 L3Y1 Nippon-Go	1/72	19/11
RL46 G3M1 Nell T.B.	1/72	19/11
<b>Tamiya</b>		
RL26 Shoki (Tojo)	1/72	4/11
RL35 C6N1 Myrt	1/48	19/11
RL31 Val D. Bomber	1/48	19/11
<b>Hasegawa</b>		
RL28 F1M2 Pete	1/75	4/11
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<b>Fujimi</b>		
RL47 F8D Crusader(III)	1/70	9/11
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November, 1967

## Fighting Colours — continued

Sqn	Letters	Example	Aircraft type	Notes/date recorded	Sqn	Letters	Example	Aircraft type	Notes/date recorded
1	JX	P3395:B	Hurricane	October 1940	238	VK	P2946:A	Hurricane	August 1940
1	YO	F3080:C	Hurricane	September 1940	242	LE	N2714:G	Hurricane	July 1940. V7467 often flown by Douglas Bader
1	QO	P3318	Hurricane	July 1940	245	DX	P3782:E	Hurricane	August 1940
17	YB	P2874	Hurricane	July 1940	247	HP	K8049	Gladiator	July 1940
19	QV	P9386:K	Spitfire	September 1940	248	WR	P8952	Blenheim IVI	July 1940. To Ftr Cmd 20.6.40, returned to C Cmd after
19	QV	P7319	Spitfire II	September 1940	249		V8610	Hurricane	September 1940. Flown by Filt-Lt J.B. Nicholson, VC
23	YF	L6841	Blenheim II	August 1940	253	SW	L2026:A	Hurricane	May 1940
25	ZK	L1512	Blenheim II	July 1940	257	DT	V8722:P	Hurricane	October 1940
		P6968	Whirlwind	June 1940		HE?	P3145	Hurricane	August 1940. 1940 sqn code is still open to question, since HE may have been used by 605 sqn
29	RO	L8637:S	Blenheim II	August 1940			P6968	Whirlwind	July 1940
	RO	R2072	Beaufighter IF	September 1940		PS	L7026:V	Defiant	August 1940
	GZ	P3144:B	Hurricane	September 1940	266	UO	P7309	Spitfire II	September 1940
41	EB	X4173:K	Spitfire	September 1940	302	WX		Hurricane	September 1940
43	FT	P3665:X	Hurricane	September 1940	303	RF	N2460:D	Hurricane	August 1940
46	PO	P3052	Hurricane	August 1940	310	NN	P3148:N	Hurricane	August 1940
54	KL	L1093	Spitfire	July 1940	312	OU	V8885:V	Hurricane	October 1940
56	US	P3055:P	Hurricane	September 1940	501	SD	P3397:H	Hurricane	September 1940
64	SH		Spitfire	September 1940	504	TM	P3774:V	Hurricane	September 1940
65	YT	K8906:T	Spitfire	May 1940	600	BO	L8626	Blenheim II	July 1940
66	LZ	N3043:K	Spitfire	September 1940	601	UF	P2673:N	Hurricane	August 1940
72	RN	K8942	Spitfire	May 1940	602	LO	N3221	Spitfire I	August 1940
73	TP	P2559:D	Hurricane	July 1940	603	XT	X4277:M	Spitfire I	September 1940. Fig-Off Richard Hilary ditched this aircraft 3.9.40
74	ZP	L1089	Spitfire	August 1940	604	NG	L8610:E	Blenheim II	August 1940
79	NV	P3050	Hurricane	August 1940	605	HE?	N2349:V	Hurricane	May 1940. This aircraft coded when used by 605 Sqn. Possibly sqn sometime recoded ML or NR? N2349 was not used by 263 Sqn
	VY	P3119:X	Hurricane	August 1940	607	AF	P2674:F	Hurricane	September 1940
87	LK	P2829:G	Hurricane	July 1940	609		R8769:D	Spitfire	August 1940
92	GR	N3194:Z	Spitfire	May 1940	610	DW	N3289:K	Spitfire	May 1940
111	JU	L1822:K	Hurricane	June 1940	611	FY	P7300	Spitfire II	September 1940
141	TW	L7014	Defiant	July 1940	615	KW	R4194:P	Hurricane	July 1940
145	SO	P3557:K	Hurricane	June 1940	616	YO?	N3269	Spitfire	July 1940
151	DZ	P3065:G	Hurricane	August 1940	F.I.U.	ZQ	L6837	Blenheim II	July 1940
152	SN	P7286	Spitfire II	July 1940					
213	AK	P3174	Hurricane	September 1940					
219	FK	L8685:N	Blenheim II	July 1940					
222	ZD	X4276:D	Spitfire	July 1940. Sqn coding not confirmed. Might be RE?					
229	KE?	P3265	Hurricane	July 1940. Sqn coding not confirmed. Might be RE?					
232	EF	P3411	Hurricane	July 1940					
234	AZ	N3239	Hurricane	August 1940					
236	ND	L1334	Blenheim II	July 1940					



# HARLEYFORD

## AIRCRAFT MARKINGS OF THE WORLD 1912-1967

Compiled and written by BRUCE ROBERTSON

Insignia paintings in colour and line drawings by W. F. Hepworth, M.I.S.A., frontispiece and other paintings by J. D. Carrick and John Stroud, produced by D. A. Russell, M.I.Mech.E., and R. E. Dock.

**EXPLANATION:** Aircraft Markings of the World 1912-1967 has a completely NEW APPROACH in presenting aircraft markings world-wide. It in no way duplicates the information in the author's earlier book Aircraft Camouflage and Markings 1907-1954, but is, in fact, a companion book.

**CONTENTS:** A COUNTRY-BY-COUNTRY REVIEW of the markings and insignia of 165 countries, states, colonies, etc. (153 pages). A CHRONOLOGY giving a date-by-date history of international aviation marking changes from 1912 to 1967 (37 pages). World map of civil registration markings.

**COLOUR:** The frontispiece is a reproduction of the magnificent duat jacket painting by J. D. Carrick. There are 12 pages with illustrations of 431 national wing, fuselage and tail markings, and civil airline emblems; 8 pages with illustrations of 24 world airline liveries shown in profile; 4 pages with 1939-1945 War and later period international markings on aircraft illustrated by photographs and profile paintings.

**PHOTOGRAPHS:** There are several hundreds, including a large number never before published. Some are large, others are 'close-ups' of insignia and markings.

**FEATURES:** Also included are reproductions of 1939-1945 War invasion and Suez stripes, manufacturers' motifs, and chemical warfare, Red Cross, detail, armament, advertising and rank markings, etc. World map of civil registration markings.

**TABULATIONS:** Aircraft finishes, serialising and designations. Translations of mottos of the 394 Royal Air Force and Commonwealth Squadron badges illustrated in the 'Camouflage book', plus a further 97 badges illustrated in the 'Markings book'. Reproduction of a further 45 insignia on U.S. aircraft in addition to those in HARLEYFORD'S earlier titles on U.S. Army, Air Force, Navy and Marine Corps fighters.

**IN ADDITION:** There are pages of line drawings of markings and insignia of the 1912-1967 period, similar but in addition to those in the 'Camouflage book'.

**SPECIFICATION:** 112 pages, over 100,000 words, on high-quality art paper. Book size 8½ in. wide by 11½ in. deep. Weight nearly 2½ lb. All colour plates made and the book printed and bound in England to our usual very high standard, with gilt blocked cloth on heavyweight millboard.

### PUBLICATION

#### DATE

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1967

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# NEW

## KITS AND MODELS

### AURORA NEWS

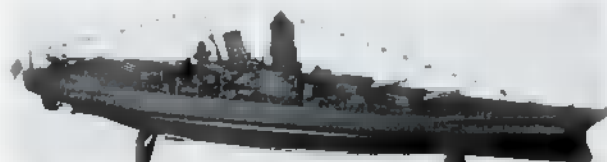
**I**MPORTANT news in the model world this month is the formation of a British subsidiary, Aurora (UK) Ltd, by the big American firm to ensure the ready availability of Aurora kits in Britain; previously they have only been available sporadically or in limited numbers. First releases under this new arrangement are three 1:48 scale AFV kits featuring the Swedish 'S' tank, the Churchill Mk III, and the M109 SP 155 mm gun. All three are very commendably finished and accurate. Of the three, the Churchill III will probably have most appeal and this is very neatly moulded, capturing the lines of the original very exactly. Features included revolving tracks and an opening commander's hatch. Assembly is very straightforward and the conversion and detailing potential is, of course, enormous. Curiously, the kit instruction notes describe the model as a Churchill VII.

Most pleasing feature of the 'S' tank is the working beam suspension which is very simple but effective. This model has an opening roof hatch and opening cupola, as well as revolving tracks. The M109 will be of interest, as this vehicle has just been adopted by the British army. The model has revolving tracks, traversing turret, elevating gun, and opening doors and hatches. All the kits were virtually flash free; the only point we would make is that 'plastic fatigue' sets in if you try pushing the models around too much on their tracks, with consequent axle breakage. Price of each model is 12s 6d, and earlier models still available include a Centurion III and Japanese Medium Type 97 to the same scale. *C.O.E.*

### FIRE-ARMS KITS

**T**HE latest in a line of fire-arms kits from Pyro (USA)—which includes a Derringer/Pepperbox set and a Kentucky Frontier Rifle as well as a fair selection of 'Western' revolvers—is a French Wheellock Pistol.

From the box-lid, which is a rather confusing painting, the finished article promises a lot. The assembly instructions, however, appear to have been written by two or three different persons and then joined together without order. We found that if the instructions were followed word for word one would end up with a complete shell and a pile of bits which should be inside it. If common sense prevails and the instructions are read beforehand a good model results. The colour scheme is taken from the box-lid painting and, again, a little sorting is needed before a good finish is obtained.



The Aurora model of Yamato, reviewed on page 112.

November, 1967

If built as recommended disaster results, but if assembled with a little thought a model worth a place on a wall is the end product. The kit costs 12s 9d and this range should interest those who often request gun kits. Stocks are held by Modeltoys, 246 Kingston Road, Portsmouth. *F.R.S.*

### BELLONA LATEST

**A** PAIR of revetted earth gun positions vacuum formed in brown plastic, are the latest addition to the OO/HO Bellona Battlefield range. These come on a common base and can either be cut out for separate use or left together to form a larger defence system. They will take virtually any model field gun in this scale and are suitable for most periods. Meanwhile an earlier release in the same series, two cottages reduced to ruins, have just been re-issued with added detail and a slight increase in size. A further Bellona venture is a general scenic range, also in vacuum formed plastic, and the latest release here is a stone culvert bridge and three lengths of stone wall. These are simply cut from the base with a knife to be ready for use. Price of these items is 3s 1d, postage extra, except for the culvert bridge and walling which is 3s 7d. *C.O.E.*

### TABLE TOP NAVY

**M**ODELTOYS of Portsmouth recently supplied us with samples of a new range of warship kits from Pyro, marketed under the 'Table Top Navy' label. The kits retail at 2s 6d each and are generally similar to the now defunct 'Eagle' series of 1:1200 scale warships.

The kits we made up were USS *Lexington*, *Yorktown*, *Washington* and *North Carolina*, and IMS *Syokaku* and *Musashi*, and the series appears to be to a constant scale of 1:1250.

The two US fleet carriers were identical kits in different packages, as were the *Washington* and *North Carolina*, so the purchaser should exercise caution before buying the whole series, as it is likely that there are only four different models to be made from the twelve kits available at present. The hulls are built in two sections to enable either waterline or display models to be built. The American ships are moulded in blue-grey plastic, whilst the Japanese units are in pale green.

There are 55 parts in the US carrier pack which builds a unit of the 'Essex' class in 1944. Detailing includes a planked flight deck, island, 5 inch and AA guns, radar and tripod mast, but no decals are included. The keen modeller will add deck numbers to correspond to the unit of his choice. The Japanese carrier has 35 parts, including island, horizontal funnels, aerials and a flight deck with moulded-in markings.

The battleships of both navies have 44 parts, and detailing includes the many AA batteries which are moulded into the main deck, funnels, main and secondary armament, cranes, catapults and in the *Musashi*, an aircraft.

Continued on next page

## New Kits—continued

The instruction sheets are concise, but adequate, being printed on the bag closure, and the kits are assured of a ready market amongst wargamers, collectors of 1:1200 scale warships, and younger modellers. I.W.

### AURORA 'YAMATO'

**T**HIS model is to approximately 1:600 scale as far as we can judge, and the finished replica measures 17 inches in length. At first sight there do not appear to be many parts in the kit, but when you get down to building it, it can prove quite time consuming.

All parts are moulded in grey plastic, and detailing is quite fair, with port-holes engraved on the hull sides, a 'planked' deck and many bollards, etc. It is not difficult to build the model so that its main and secondary armament rotate, but all barrels are of necessity fixed. A crane, aircraft platform and seaplane grace the fantail, while a number of flags and pennants are included to dress the ship overall should you wish to rig it.

The *IMS Yamato* was one of a class of two battleships launched, fought and sunk in the Pacific during the last war. They were the most powerful battleships constructed, carrying nine 18 inch guns main armament, supplemented by twelve 6.1 inch and twelve 5 inch high angle guns in addition to a vast array of smaller anti-aircraft weapons. Here we have found an anomaly concerning the kit, for nowhere can we trace records of either the *Yamato* or her sister ship, the *Musashi*, carrying nine 6.1s, as depicted by Aurora's model. Nevertheless, this is an interesting replica of the 64,000 ton battleship, if expensive at 24s 6d. D.C.N.

### NEW COACH KIT

**K**'S have scored a magnificent triumph with their latest coach kit, the GWR 57 ft 'B' Set coach. These coaches were permanently coupled in pairs with the luggage compartment at each end and were the mainstay of GWR branch lines.

K's have employed the ideal combination of metal and plastic; cast metal bogies and turned metal 2-rail insulated wheels for maximum track holding and rollability, brass buffers for strength and plastic body mouldings for maximum detail coupled with lightness. The body sides are moulded in cream plastic and only require painting with GWR chocolate below the waistline and around the drop windows in the doors. The roof, ends, bolsters and truss rod assemblies are moulded in black plastic. Clear glazing material and cast metal roof vents are also included.

No floor or compartment partitions are supplied and we recommend these are added from 30 thou plastic card. We also suggest the additional purchase of four 10 BA nuts to tighten up the buffers—they are rather a loose fit in the holes already pierced in the buffer beams. Facilities for fitting Peco couplings are included but no couplings are supplied and these are left to individual preference. Assembly of the kit is easy and quick. The bogies can be soldered or glued with epoxy adhesive. A fair amount of flash exists around the plastic parts but this is more than made up for by the superb detail. At 24s 10d this is a real winner. Our sample was supplied by BMW Models Ltd of Wimbledon, who hold stocks of this and most other kits in the K's range of railway models. N.S.



Above: The Tamiya AMX twin-30 mm flak tank (Blue Label) and the new K's GWR coach, both available from BMW Models of Wimbledon.

### MORE FROM JAPAN

**B**MW Models Ltd of Wimbledon have made further additions to the range of Blue Label tank kits which they import from various Japanese manufacturers. Among our recent samples have been two variants on the French AMX 13 light tank chassis to the usual 1:35 scale by Tamiya, a 1:35 scale US Army M3 half-track by Nitto, and a remote action 1:35 scale model of the Japanese Type 61 from Nihon Hobby.

Taking these in order, the two AMX 13 variants are the AMX 105 mm SP howitzer and the AMX twin-30 mm flak tank. Both models have identical chassis components, only the gun housing and armament differing in each kit. Like most Tamiya models, these are quite easy to assemble, and come complete with electric motor and working tracks, using two torch batteries (not supplied) to provide the power. The instruction sheet has an English text and is well illustrated and these would make ideal beginners' models due to their relative simplicity. Quite apart from this, they are the only AMX light tank kits yet available. As completed, the models appear quite accurate, though standing a little too high on their chassis we thought. Each kit costs 19s 11d.

Nitto's M3 half-track is a very fine job indeed with track-rod steering for the front axle, an electric motor which is located under the bonnet to drive the rear sprocket in prototype fashion, and revolving rubber tracks at the rear. Assembly and packing follows Tamiya's fashion, though the instructions are in Japanese only—but easy to follow anyway. The batteries drive the motor from under the rear compartment floor and there is an optional twin .5 inch Browning gun mounting which can be located in the rear if desired. Detailing is excellent, and we suspect that this model may owe something to Monogram's static M3 in this respect. Price is 19s 11d.

The Type 61 is a good replica of the Japanese Self-Defence Force's standard tank, resembling the Patton in many ways. This kit has the rather complicated cam and gear 'five action' system by which a selection of levers can be pre-set to make the model do any number of manoeuvres while under way. It can be made to go in a zig-zag, traverse its turret, turn 90 degrees, or turn right round. This is good fun if you've experience enough to assemble the complex gearing—we wouldn't commend it to beginners, however. Instructions are in Japanese only which makes construction quite a slow process due to the need to identify the many components. It can, of course, like all the others, be made as a static model if desired. Price is 27s 6d. C.O.E.





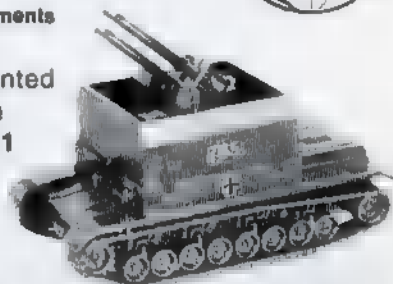
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Carrier 2/3; 214 German Person-  
nel Carrier 1/11; 215 Ger-  
man Ambulance 1/11; 216 Ger-  
man Observation Tank 1/11;  
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German Assault Gun 111/2 2/6;  
174 German Tank 111/G 2/6;  
173 Modern German 23-ton Tank  
Destroyer 2/6; 175 German Tank  
111/J 2/6; 172 Modern German  
Standard Tank; Leopard 2/6;  
171 German Tank Destroyer  
'Hunting Tiger'  
2/6; 169 US  
Cargo Tractor  
Trailer 3/9; 168  
US Fuel Tank  
Tractor Trailer  
3/8; 127 German  
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Gun 1/11; ■  
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# Letters to the Editor

Letters to the Editor can only be answered in the magazine. Readers whose letters are published each receive a free Airfix plastic construction kit of their choice. We are always pleased to receive your comments and pictures, which will be considered for publication. Submitted material and pictures can only be returned if accompanied by a stamped addressed envelope, and the Editor cannot accept responsibility for safe keeping of any such contributions, neither does he necessarily agree with comments expressed by correspondents in the letters columns.

## Father's Firefly

**A**MONGST my collection of Airfix models I have the Fairey Firefly coded 202. This is one of my greatest treasures as the original aircraft, WB351, was flown by my father in 817 Sqn with the RAN. He was the observer. He mentions that the ASH bomb was not usually carried on operations, another drop tank being fitted in its place.

G. J. Kenderdine, Gerringong, NSW, Australia.

## Painting warships

**M**AY I offer what to me is a most impressive colour scheme for the Airfix warship model series including such favourites as *Warspite*, *Head* and *Scharnhorst*. Though simple, this process is lengthy and demanding.

Three basic colours are required. The first is Humbrol No 28 matt light grey, almost an off-cream colour, which should be applied to every part normally listed as 'Battleship Grey'. Even application is easy, provided that the paint is well stirred and thickly applied; otherwise a second, very laborious coat will be necessary. It is a good idea before application to test the paint on a piece of elastic ribbing. The below-the-water line part of the hull should of course be masked off in the traditional manner with Sellotape before the upper hull is painted.

The second basic colour is matt slate grey, Humbrol 27, and all the upper surfaces except the main decks, which are painted tan, should be painted in this colour including the insides of the hullworks which enclose many of these parts; the actual deck edges should be painted light grey. This will produce a most striking aerial effect with the light edges standing out in sharp contrast to the dark grey upper surfaces.

A similar sideways effect can be obtained by applying the third basic colour, matt black, to all portholes and to anchors. This striking effect can be further enhanced by those who are skilled enough to paint on, in black, such details as ladders, hinged doors, wall ventilators, and piping. The deep-red of the lower hull will also shine out in contrast to the light-grey.

I have found this scheme most rewarding; it is based on the simple contrast of dark and light.

N. Dogger, Oxted, Surrey.

## Whirlwind details

**H**AVING done a considerable amount of flying with 22 Sqn's Whirlwinds, I would like to add some details further to September's conversion article.

The interior of the cabin is lined with a

light green rubber, to prevent salt-water corrosion, this colour can be obtained by mixing Humbrol 24, 25, and 34 in equal proportions; the 'quilting' behind the pilot's cabin is the same shade. Above and behind the pilot are flares and radio equipment, plus emergency controls for the winch.

Returning to the main compartment, the port wall is taken up by single and double-lift straps, a grabber hook (used for US aircrew, the design of whose lift-vest does not permit the use of the normal strap, it is merely a large 'dog-clip') and spare Mae Wests, all of which hang between and aft of the windows. Above and centrally between the two windows is a first-aid kit in a yellow canvas satchel.

The forward bulkhead is broken by the transmission housing which slopes from the level of the cockpit floor to the rotor head. It should be noted that this and the cabin above the top of the windows (where the rubber ends) is painted glossy dark green (Humbrol 30, gloss varnished). On the starboard side is a rack which normally holds four or five smoke floats. In the centre is a chest containing a comprehensive medical kit. The port side is normally kept clear to allow the navigator access to the cockpit (to facilitate this the port seat and control column are stowed, the aircraft being flown from the starboard seat).

Finally, the starboard wall aft of the door is occupied by two folding canvas seats.

The crew is three strong and all wear dark grey immersion suits (Humbrol 31) with Mae Wests and waistcoat type personal dinghies; it must also be noted that throat-mics, and not oxygen masks, are worn. Parachutes aren't worn due to the low altitude nature of operations. The winchman, who normally sits in the doorway, is held in by a waist strap attached to a static-line rail running fore and aft along the cabin roof. (These aircraft are in fact equipped for para operations and the canvas wrapping on the mainwheel legs cover weapon attachment points.)

Turning to markings, serials from my log include XP346, 347, and 353. A new addition is the Sqn crest in a 1-ft. square mounted centrally on the door, and on the corresponding position on the port side.

Other details such as winch, pitot head, and windscreen wipers can be seen in the photo given, and can easily be constructed from stretched spruce.

I hope we will see more of these articles in the future as I'm sure many brilliant modellers are to be found amongst your readership.

M. Verrier, Canterbury, Kent.

## Transfer method

**R**EADERS may be interested in a method of using Dry Print or Letra-set, letters and numbers, on models which I have discovered.

While converting a model I found the only letters available to the correct scale were Black Dry Print type, but these were almost impossible to use because of the position of the letters on the plane.

In despair I decided to try this method. I found some transparent oil-cuts from standard transfers and printed the desired Black letters on to this. I then used this as a standard transfer which slid into the required position.

B. A. Hadley, Warley, Worcs.

## Shadow boxes

**M**ANY letters have appeared in the magazine concerning the display of models. Having a small son with clutching fingers, my answer to the display problem was to use shadow boxes such as are sold for displaying small potted plants. This is an ideal way of displaying AFV models as several variants on the same chassis can be placed in the same box. These boxes are designed to be hung from the wall and so can be set high enough to be beyond the reach of children.

A. W. Law, BFPO 53.

## Making hinges

**H**AVING read other ideas concerning the method of making hinges, I thought readers might be interested in my way. This is fairly simple: first drill small holes with a hot pin in the parts to be hinged, making sure that these line up with each other. Then a U loop of fuse wire is pushed through the holes and the ends joined by twisting. The ends are cut off neatly, leaving the loop joining both pieces. I tried this very successfully on the hinged truck sides of the Flak 36 conversion.

Neil Anderson, Belvedere, Kent.

## British lancer

**R**EADERS might be interested in my method for the construction of a 1914-18 British lancer. The lancer is made in conjunction with the 1914-18 article in the August, 1966, AIRFIX magazine. The basic parts are a 1914 British soldier striking with his rifle butt, a US cavalryman and an Eighth Army soldier. Begin construction by carefully removing the rifle from the 1914 soldier, leaving a flat surface. The parts of the body below the jacket are then cut off square to the jacket and the legs of a US cavalryman are added, using UHU for the joint. A lance is now made from heat-stretched spruce. Before the lance is fitted, the

AIRFIX magazine



forage cap can be replaced by an Eighth Army helmet if desired, using UHU. The lance is then fitted with UHU (it can be cut into three pieces for easier fitting). A US cavalry horse is used.

E. Dahlhof, Bootle 20, Lancs.

### Kingfisher episode

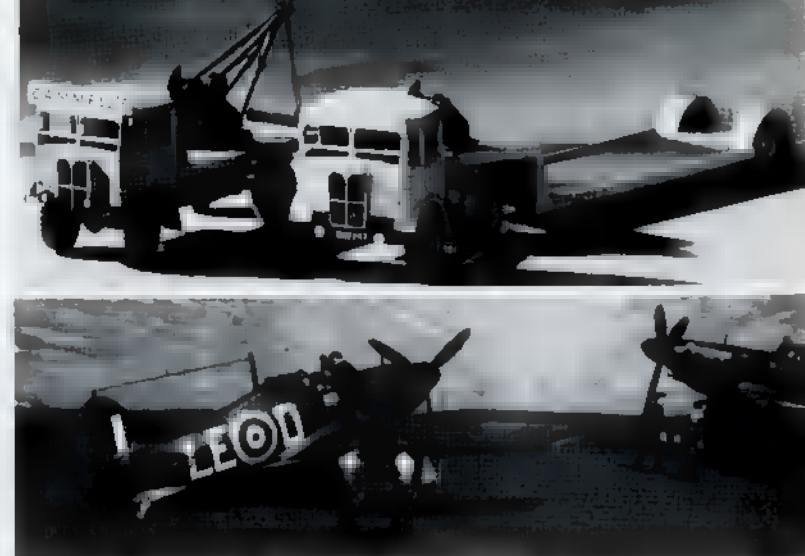
I SHOULD like to congratulate Airfix on the fine model of a Kingfisher, the best from Airfix for many a day. Readers may like to hear of one of the more hair-raising Kingfisher episodes. I believe that only two Royal Navy cruisers—as opposed to armed merchant cruisers—actually carried Kingfishers, and these were the sister ships *Emerald* and *Enterprise*. In 1944, *Enterprise* was in Portsmouth Harbour alongside Pitch House Jetty when her Kingfisher was accidentally fired off the catapult. This was frowned on, and the ship was moved to the upper harbour. I think this is the only occasion an aircraft has been catapult-launched in Portsmouth Harbour.

E. E. Ward, Cosham, Hants.

### Barrage Balloon model

A RECENT query in your correspondence columns prompts me to write the following description of a model in my collection (illustrated here — EDITOR).

This is the Britains' Model No. 1855, which is the smaller of the two scales of model manufactured. This model is described as being 'to the same scale as 00 gauge', whilst another similar model, fitted their then current range of lead soldiers, vehicles, guns, etc. I think the smaller model was priced at about 3s, whilst the larger was around 9s 6d ■



**Top:** The two Airfix Matador conversions referred to on this page by D. E. Jane. Crane truck, in particular, is typical of ex-WD types adapted for service station use. **Above:** Reader A. Dodsworth of Hull sent us this view of his Airfix Hurricane finished as Bader's machine V7476 mentioned in *Fighting Colours* this month. RAF personnel are adapted Airfix soldiers.

10s 6d in 1939.

The casting is somewhat poor by present-day plastic moulding standards, but was creditable none the less. The Balloon must have been especially tricky to mould as it is not solid, this would account to some degree for the higher price than comparable Dinky Toys then in vogue which were priced between 4d and 3d.

The vehicle had a hook at the rear for a gas cylinder trailer, or other appendage. The vehicle was painted a gloss Khaki, although in actual practice the Balloons, but I believe, operated by the RAF. This lorry was designed on a Fordson chassis, whilst the larger scale (1:32) model was a hybrid design by the manufacturer, which was also used as the basis for one or two other Army vehicles, notably a tipper waggon.

The vehicle has die cast wheels, and a working winch drum which enables the Balloon to be raised or lowered. The top of the Balloon was suspended by two eyelets through which a loop of thread passed. The length of thread then passed over a eyelet or hook in the ceiling where the Balloon was to fly, and thence down via a front eyelet on the Balloon to the lorry winch drum. The drum, incidentally, was fitted with a small handle, and also a small off-centre peg at its end to prevent the drum unwinding.

The balloon was 3½ inches long and the lorry 2½ inches long. About the only thing omitted was the protective wire cage over the winch, which was impractical in this scale.

Keith Tutton, Manchester 13.

This Barrage Balloon outfit was from the Britains Lilliput range. At 00 scale it makes a perfect addition to present-day military collections for anybody lucky enough to find one. It is not, of course, available from Britains today.—EDITOR.

### Matador models

I HAVE been following with interest the various articles on AEC Matador conversions, particularly the latest, the crane truck, in the August issue. I enclose a photograph (included here—EDITOR) of my attempt at a Matador

crane truck together with an articulated conversion.

The cab and chassis of the crane truck were made exactly as per kit, with the addition of a rear cab window, lights, number plates, etc. The platform is a piece of 30 thou styrene 56 mm x 28 mm, scribed to represent planking, glued to the existing platform floor, with strips of 30 thou styrene 2½ mm high around the sides. Incidentally, I find a triangular needle file the best tool for the job of scribing planking.

The crane itself was made from various parts of the gun carriage and lengths of round Structo rod. It does not represent any particular type of crane, but it looks vaguely 'like the real thing'. The toolbox behind the cab was made from styrene sheet and measures 15 mm long x 4 mm wide x 6 mm high.

The articulated lorry is really a bit of a diabolical fiddle, as the cab happens to be sitting on a Peen Road-Railer prime-mover chassis! Although it has got Matador axles, fuel tank, etc. fitted to it. The cab was again built as per kit, but the corners of the roof were rounded off, and a rear window fitted as before. The low-loader trailer was made from 50 thou styrene, again scribed for planking and again with 30 thou styrene strips on the sides, this time 3 mm high. The actual flatbed measures 180 mm x 30 mm. The mudguards come from the kit. The winch is made from parts of the gun carriage.

I have retained the original wheels on both models.

D. E. Jane, Sheffield 9.

### Correction

HAVING just obtained the October issue of the magazine, I think I have found a slight slip in the squadron listing given in 'Fighting Colours'. Surely P2798, I.K.-A was 87 Sqn, and P3119, VY-X, was 85 Sqn and not vice versa? Also which date should go with which aircraft?

Owen Thompson, London, NW8.

Quite right—our error. Reverse the squadron numbers only.—EDITOR.

Due to pressure of space, Photopage has had to be held over this month.

# Fighters — 1940

AS A SUPPLEMENT TO 'FIGHTING COLOURS,'  
MICHAEL J. F. BOWYER  
PRESENTS SOME TYPICAL MARKING SCHEMES



(1) X4474, a Spitfire I of 19 Sqn at Duxford, probably photographed in the last week of September, 1940, with Sky undersides. Note serial '1'. (2) Delianis of 264 Sqn, mid-summer 1940. PS-U is the centre of this flight is the subject of a drawing on page 107. PS-Z is interesting for the faded blue and yellow in the fuselage roundel. Aircraft is L7029. PS-O is L7018. PS-R is N1576. (3) Hurricanes of 73 Sqn on patrol in France in the winter of 1939-40. Note rudder stripes to conform with French style. J is P2575. D is [redacted] and TP-E is N2517. Under surfaces are black/white/silver. (4) P3395 of No 1 Sqn. Wittering in September, 1940. Spinner is probably black with white ring. Finish is green/dark earth/Sky with grey codes. Note wasp-type emblem, exhaust stain, and scuff marks. (All photos Imperial War Museum.)

## Ernest Berwick

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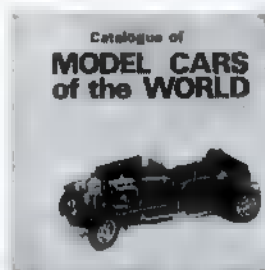
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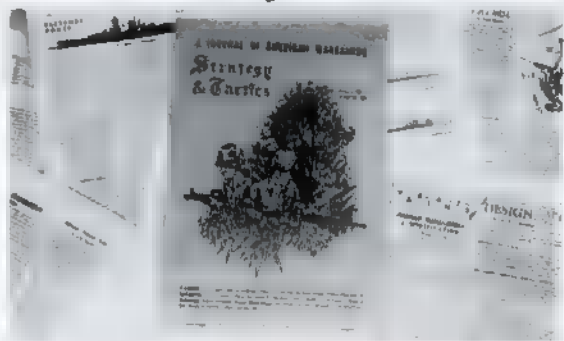
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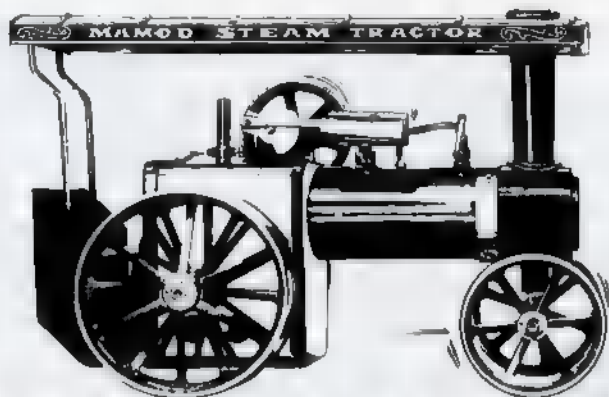


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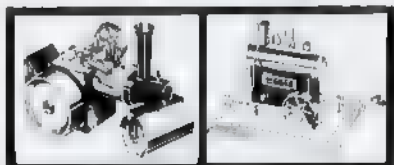
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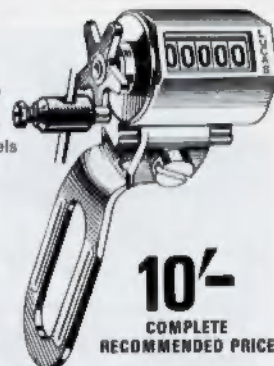
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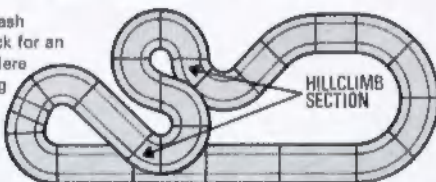


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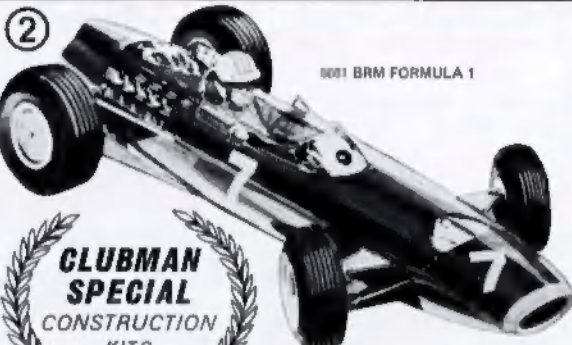
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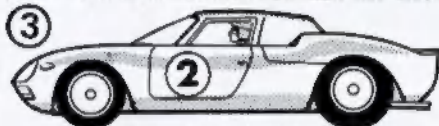
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